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VOLUME 161 NO. 14 SEPTEMBER 30 1961 ONE SHILLING

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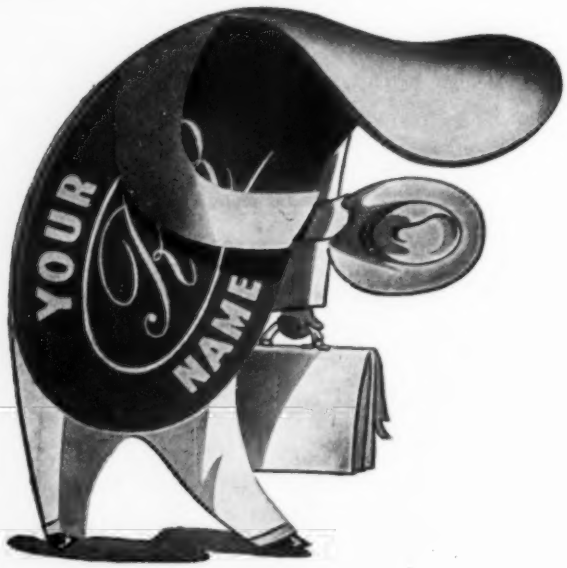

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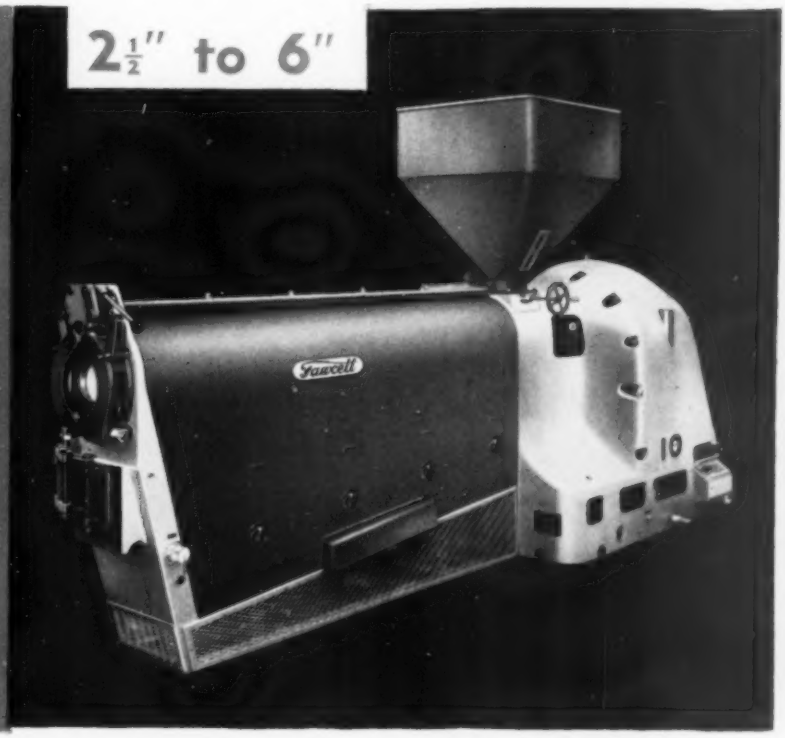

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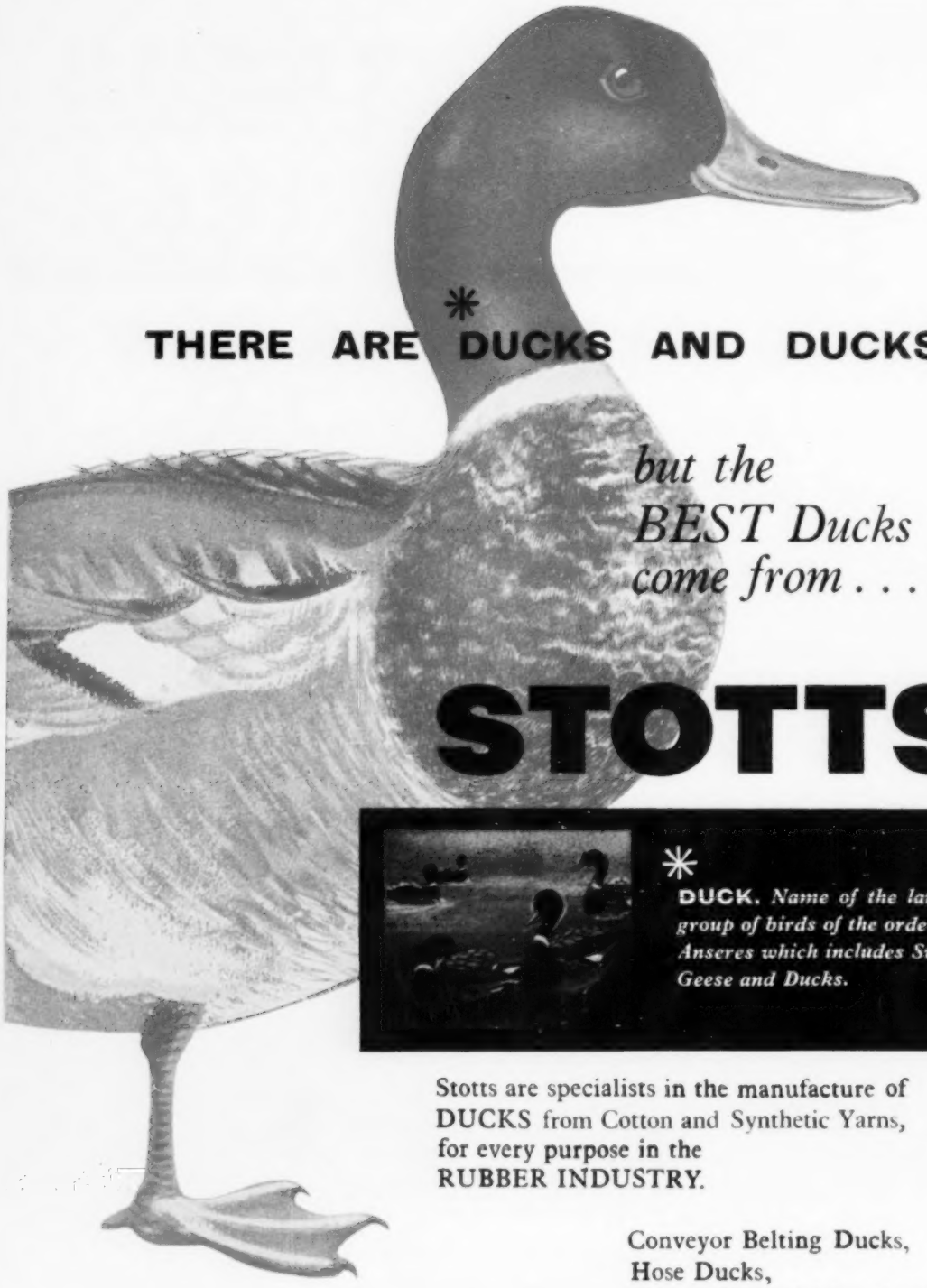

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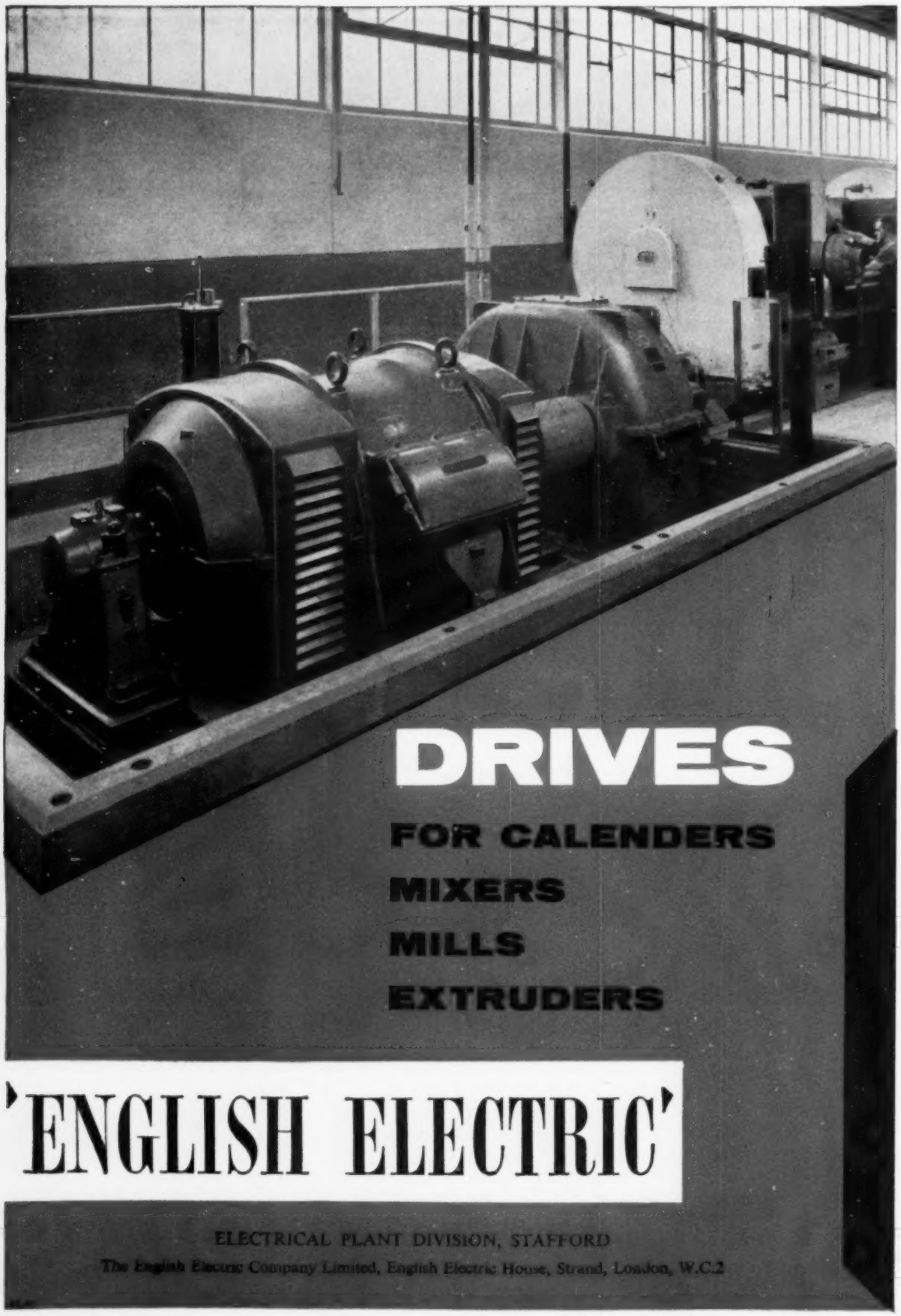
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RUBBER and PLASTICS WEEKLY

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September 30 1961

Editorial

NOTES OF THE WEEK 495

Articles and News

NEWS BRIEFS 496
PLASTICS PIPE SOCIETY FORMED 497
AVON HIGH HYSTERESIS TYRE 498
RUBBER'S ACCIDENT RATE UP 500
NJIC COMES OF AGE 502
PLASTICIZERS FOR PVC — PART 4 504
NEW ASPECTS IN PVC 506
PLASTICS MACHINERY DEVELOPMENTS 515
IRI GOLF 519

Features

VIEWS AND REVIEWS 508
MEN AND MATTERS 510
THE LEGAL ANGLE 512
PLANTATION NEWSLETTER 517
RUBBER STATISTICS 517
BOOK REVIEW 518
RUBBER AND PLASTICS STOCK MARKET 520
RUBBER MARKETS 521
INDUSTRY INTELLIGENCE 522

Classified Advertisements . . . 524 Advertisers Index . . . 528

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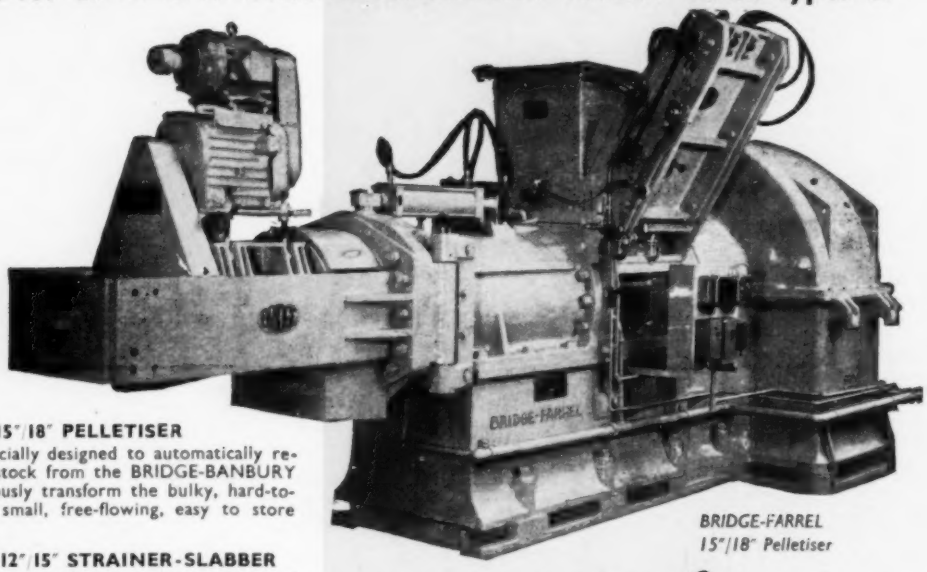

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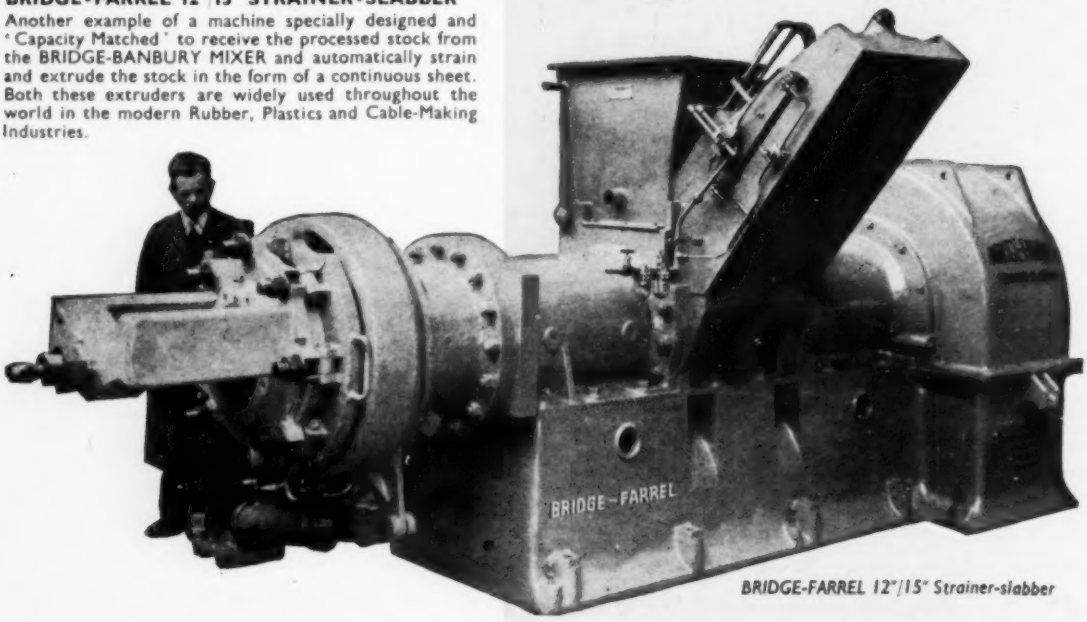

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NOTES of the WEEK

A Bad Year

LAST year was a bad one for industrial safety, as the report of the Chief Inspector of Factories shows only too clearly. (A full account appears on page 500.) It makes depressing reading, both for industry as a whole and for the rubber and plastics industries in particular. In spite of all the efforts that have been made both by organizations and individuals in our industries — and in spite of the pioneer work that the rubber industry has carried out on many aspects of safety — the accident incidence rates continued to rise. The incidence rate (number of accidents per 1,000 employees) for rubber went up from 20 to 22, and plastics moulders and fabricators from 14 to 15. The average for all industry was 20.7. The increase in the incidence rate, which has occurred in most industries, shows that changes in the number of accidents were not directly proportional to changes in the labour force. The report includes rubber as one of six industries with the most marked increase in the incidence rate

One of the most depressing things about the report is that points made in previous reports seem to have made little impact. For example, exactly a year ago, when dealing with the 1959 report, *RPW* stated that the largest number of accidents in the rubber industry — 520 or 28% — happened during the handling of goods. The 1959 report showed clearly that there was a good chance for improvement in this category with the wider introduction of mechanical handling and a better understanding of the dangers of faulty methods of handling. But what happened? The number of handling accidents in the rubber industry not only went up in number (to 638) but also in proportion (to 29%). It makes us wonder if, in spite of the publicity given to the report, in spite of the Minister of Labour himself showing his concern by speaking at a press conference held before the publication of the report — and in spite of all the good intentions engendered by all this — the 1961 report will show any significant drop in accidents. The danger is that we shall be careful for seven days and then, gradually, relax and drop our guard.

The Safety Attitude

SAFETY must be kept in mind all the time and acquired by everyone, from the boardroom to the shop floor, as an attitude of mind. Courses such as 'Safety in the Plastics Industry' organized by the Birmingham and District Industrial Safety Group and to be held on December 5 and 6 1961, will help to do this. Coming at a most appropriate time the course, which has been arranged in collaboration with the joint education and training committee of the Plastics Institute and the British Plastics Federation, will be mainly directed towards those vital links in the chain of safety—charge hands and supervisors.*

The causes of accidents and their prevention have been fully analysed. The main problem is one of constant training and publicity and, so far as the latter is concerned, *RPW* intends to do all that it can. Articles on safety will be published, and we will endeavour to report incidents that are not usually reported. For instance, serious accidents arising from failure to wear protective clothing receive publicity and are ultimately recorded in accident statistics. But, when the clothing has been used and an accident averted, usually no one hears about it. We would like to report these cases as fully as possible, and we invite all companies and organizations within our industries to send us full information about such cases. By these means we hope to draw constant attention to the need for industrial safety, since it is only by constant attention to the problem that the accident figures can be checked and made to fall.

Twenty-one on Tuesday

A MORE cheerful aspect of the industrial scene was celebrated at the Guildhall on Tuesday (September 26), when the Minister of Labour, the Rt. Hon. John Hare, was the principal speaker at a dinner commemorating the coming of age of the National Joint Industrial Council for the rubber manufacturing industry. Although there has been considerable unrest in many other sectors of industry, rubber manufacturing can take pride in the fact that during the 21 years of the NJIC's existence there has been no official strike. In a diverse industry employing over 80,000 people this is a considerable achievement. Over 150 firms, covering at least 80% of the industry's workers, implement the decisions of the NJIC, which was formed in 1940 to establish by joint consultation fair wages and conditions of employment. Credit for the achievement goes to the bodies forming the Council — the Rubber Manufacturing Employers' Association, the Transport and General Workers Union, the National Union of General and Municipal Workers, the United Rubber Workers of Great Britain, and the Union of Shop Distributive and Allied Workers. And the other activities of the Council must not be forgotten. Although the accident figures discussed above are bad, it may be contemplated how much worse they would have been without the Council's accident prevention committee.

* Applications should be made to the Director, The Industrial Safety Training Centre, 22 Summer Road, Acocks Green, Birmingham 27.

NEWS *Briefs*

EPOXYS FROM AUSTRALIA—PIRELLI PLANT FOR SICILY—ENI GETS INDIAN CONTRACT—NEW US ANTIOZONANT PLANT—SINGAPORE M$50m LOAN

●**Singapore** — The Singapore Government announced recently that it was floating a new M$50m. loan for industrial development. This is the fourth loan to be floated by the present Government.

●**Malaya** — The issue of 4,680,000 shares of the new Dunlop Malayan Industries Limited was oversubscribed on September 21, the first day of public subscription (see Plantation Newsletter, September 16, 453). The application lists remained open until September 23.

●**Sicily** — Plans to build a large tyre factory at Villafranca, Tirrena, near Messina, have been announced by Pirelli Societa per Azioni of Milan. The factory, which initially will cost 2,000m. lire, will have a complete and autonomous line for the production of tyres to be sold domestically and in foreign markets. The company has not disclosed the capacity of the plant, although it has said that the plant will be one of the most important factories in Italy.

●**United States** — Universal Oil Products has announced that it will build a plant to manufacture a new antiozonant. It will have a capacity of more than a million lb. annually and is scheduled for completion late this year. The cost of the project was not disclosed.

●**Dominican Republic** — The first batch of home-produced rubber to be marketed in the Dominican Republic (seven tons), has been sold to the Dominican firm of Celso Perez, producers of footwear and tyre-retreading and industrial material. The firm at present imports 50,000 kilos of natural and synthetic rubber but with the growth in rubber production over the next few years the country should be able to supply all its requirements. At present 5,000 trees are in production at Piedra Blanca and by 1964 a total of 250,000 trees will be producing.

●**South Africa** — Preliminary discussions on the building and financing of a synthetic rubber plant at Sasolburg have been initiated by the Industrial Development Corporation of South Africa. This plant would use by-products from the Sasolburg oil-from-coal plant to manufacture rubber, mostly for South African-made tyres, but also possibly for export. The scheme is still in its initial stages. Sources of know-how in several countries have been asked to submit ideas and costs, but it is unlikely that work on the site will start before February, 1962.

●**Australia** — A little over a year after its establishment the £A600,000 petrochemical plant at the Shell oil refinery in Sydney will soon ship its first export orders to New Zealand. Other markets in South East Asia will also be supplied in the future. The plant has an annual output of 1,000 tons of epoxy resin.

●**Nigeria** — The Western Nigerian Ministry of Agriculture and Natural Resources has intensified its activities aiming at increasing rubber production. A rehabilitation scheme has already started with the replanting of some rubber plantations, ruined by bad tapping, by new, high yielding varieties. Planting of high yielding rubber seeds from which farmers could be supplied at subsidized costs has also been started. A five-acre plot has been cleared for this purpose for a nursery plantation of rubber seeds from Liberia. Two million high yielding rubber seeds have been distributed to farmers from the Camerouns Developments Corporation and the Sapele rubber estate and farmers will be given training in the correct way of tapping and the preparation of good rubber latex.

●**Ceylon** — A contract valued at 28m. rupees has been signed by Ceylon and the Soviet Union for the construction of a rubber tyre and tube factory. The factory is expected to be in production in 1965. Initial annual output will be at the rate of 250,000 tyres.

●**India** — Preliminary talks have taken place between the Italian firm ENI and the Indian Government and an agreement is expected to be signed shortly. Under this agreement ENI will undertake the construction in India of oil refining facilities and plant for petrochemical production. Drilling equipment and services for exploration will also be supplied under the agreement which is expected to cost the Indian Government about $100m.

'Who's winning?'—556

Plastics Pipe Society Formed

BY SIXTEEN MAJOR MANUFACTURERS

A PLASTICS Pipe Manufacturers Society has been formed by 16 of the major companies in the field. The chairman of the new society is F. H. A. Mackrill.

The main objects of the society are to 'encourage product research and to ensure the highest standards of quality in all plastics piping offered by the member companies, by furthering the use of only first quality raw material and by the application at all times of the most stringent quality controls'.

Members have agreed to keep to the requirements of any British Standard for plastics pipe and will, in fact, work towards the general adoption of the Kite Mark of the British Standards Institution.

The society states that it will 'energetically take steps' to protect users from installing plastics pipe systems of inferior quality.

The Plastic Pipe Manufacturers Society will support the British Plastics Federation — which has recently set up a separate group to cover plastics pipe and fittings manufacture — particularly from the technical point of view.

The Plastic Pipe Manufacturers Society has joined the British Standards Institution, and will seek representation on the various committees of BSI concerned with the formulation of Standards for plastics pipe systems.

The new society is based at 21 Bennetts Hill, Birmingham (Tel.: Midland 0994) and its secretary is D. F. Dodd.

The sixteen founder members are: Allied Structural Plastics Ltd., Chemidus Plastics Ltd., Durapipe and Fittings Ltd., Extrudex Ltd., Formica Ltd., Foster Brothers Plastics Ltd., Grey and Marten Ltd., David Mosley and Sons Ltd., P. H. Muntz and Barwell Ltd., Plastic Tube and Conduit Co. Ltd., Stamford Engineering Co. Ltd., Stewarts and Lloyds Plastics Ltd., Tenaplas Ltd., The Wednesbury Tube Co. Ltd., Wellington Tube Works Ltd. and Yorkshire Imperial Metals Ltd.

COID Advisory Panel

Since *Design* magazine began reviews of the design standards of prefabricated farm buildings, landowners, manufacturers and officials have increasingly turned to the Council of Industrial Design for advice on the subject.

The Council has set up an advisory panel on farm buildings under the chairmanship of F. J. Stratton, CBE, chairman of the Fatstock Marketing Corp. Ltd.

Farm buildings may be prominent in the landscape, so their design is of some public concern, particularly as many are subsidized from public funds through the grants of the farm improvement scheme. They are also relatively free of planning control.

As a first step, the panel will survey the range of standard components in concrete, steel, aluminium, timber and plastics which is already available. This will be done with a view to recommending profitable lines of development and drawing attention to the more promising aspects of current production.

Rubber Shipping

A joint working party has been appointed by the Ministers of Finance of Singapore and the Federation of Malaya to discuss the Rubber Shipping and packing Control Ordinance. This is said to be with a view to making recommendations for setting up a strong Malayan Rubber Export Registration Board.

Overhaul Needed

The Federation Commerce Minister, Khir Johari, said that the present Board had not been effective in recent years and that a thorough overhauling was required.

The Board keeps an eye on the quality of Malayan rubber shipped abroad, but there have been complaints from consumers about inferior qualities shipped.

Polmers Against Ice

MARSTON EXCELSIOR LTD., a subsidiary company of I.C.I. Ltd., has developed a method of radome construction incorporating a system for preventing the formation of ice on the outer surface. Rubber and plastics play a prominent part.

Anti-icing is achieved by ducting hot air through a system of channels between the inner and outer reinforced glass-fibre skins. The channels, which are of triangular shape, are formed in the expanded rubber core and are lined with a thin glass-cloth laminate to provide additional strength.

All-over Strength

A special pattern has been evolved which permits the use of channels of constant cross-section, which is important for achieving adequate mechanical strength over the entire surface of a radome.

Before adopting the present patented construction, the company says that consideration was given to other means of providing a heated surface. The incorporation of electrical elements or grids in the structure was discarded 'for reasons of electrical performance'. The use of a liquid heating medium had attractions from a heat transfer point of view, but has not been adopted owing to the difficulty of finding a liquid both chemically inert and having a similar dielectric constant to the radome structure.

The company considers that this type of construction could also be used for cooling radomes which are subjected to high kinetic heating.

Percy W. Howard, president, prepares to lay the foundation stone of the new plastics research laboratories at the ceremony which took place at Shawbury on September 20. (*RPW* **September 23, 465)**

Avon High Hysteresis Tyre

23% IMPROVEMENT IN WET ROAD-HOLDING CLAIMED

THE Avon India Rubber Co. Ltd. has announced 'the first high hysteresis car tyre for the everyday family motorist at no increase in price'. Called HM Safety, it has cling treads which are said to give a 23% improvement in wet road-holding.

Like the Turbospeed Mk. II for high speed cars, HM Safety is of two-fold construction with the 'cling' treads allied to resilient sidewalls. There is an absence of tyre squeal when cornering, and no increase in power or fuel consumption.

Extra-resilient undertread and sidewalls compensate for the additional heat built up in the cling tread and give a cool running tyre.

Prior to the tyre building process the cling tread and extra-resilient sidewalls are married by the Avon twofold extrusion technique.

The new tyre is available in sizes for most modern cars, and will be displayed at the Motor Show.

Safety demonstrations are being carried out by Avon on the new tyre.

The circular testing track used for these demonstrations consists of two diametrically opposed high-skid sectors of polished stones separated by two stretches of macadam. The high-skid sectors are constantly lubricated by sprays of water.

Electric lamps are set up at regular intervals around the inside of the track; lighting up in sequence they give the driver a travelling spot of light or 'hare' to chase around the pan.

Two identical cars are used in the demonstrations, one fitted with HM Safety tyres, the other fitted with a different type. The cars are driven slowly around the circuit 180° apart and gradually accelerated until each is just behind its 'hare'. By following the travelling light the two drivers make sure that they are both travelling at an identical and constant speed. A direct comparison can then be made between the two sets of tyres by driving on first one set and then the other.

A pneumatic rubber strip is laid on the outside white line of the high-skid stretches connected to a bell. Drivers are thus given an indication when they have skidded out of bounds.

Before construction of the pan, the Avon Engineering Department consulted the Road Research Association for advice on surfacing techniques and materials. Road Research recommended round pebbles ⅛in. to ¼in., laid in high viscosity tar. The pebbles, 150,000 in all, were obtained from gravel at Seatown, near Bridport.

The pebble surface is sprayed with water to create a slippery surface which effectively demonstrates the contrast between the wet road-holding qualities of different tyres. In between the polished stretches the surface is constructed of a local stone Dough Bake — which does not polish, giving the greatest possible contrast between low-skid and high-skid stretches.

Irish Ropes forms Subsidiary

Irish Ropes Ltd. has for a number of years been developing the use of sisal in various forms for reinforcing polyester and phenolic resins.

Plytawn Ltd. has now been established as a subsidiary company to handle the development, manufacture and sale of sisal for reinforced plastics applications.

Chopped sisal fibre is used for dough-moulding compounds and considerable progress has since been made in the production and use of bonded mat and woven fabrics.

Biggest

Evode Ltd. will launch its biggest ever TV campaign on October 2.

Code of Practice for Packaging

BPF PACKAGING GROUP FORMS TECHNICAL COMMITTEE

A TECHNICAL committee has been formed by the packaging group of the British Plastics Federation to exchange and disseminate technical information on plastics in packaging for the use and benefit of the consumer and plastics industries.

With the co-operation of manufacturers of plastics for packaging, the committee plans to devise standards, tests and practices to raise the quality of its goods. The committee will also consider specific technical problems referred to it by the packaging group.

Priority is to be given to the preparation of a code of practice covering the use and suitability of the large variety of plastics available in the various consumer fields. It is hoped to issue this general code of practice within a year, and it will be enlarged and brought up-to-date by re-issue over subsequent years.

Test Methods

'The code should enable the consumer to choose the right material and type of package for his particular job, and the criterion by which he must judge such materials', said Dr P. P. Hopf, chairman of the technical committee. 'Particular reference will be made to the nature of goods to be packaged, and relevant properties of suitable plastics materials.

'To determine test methods and standards the committee aims at examining jointly special problems common to the whole industry, particularly odour, permeability, pigmentation and additives. Specialized sub-committees will be set up provided there is sufficient support'.

The committee proposes to work in the closest co-operation with other bodies already in this field, such as the British Standards Institution, Institute of Packaging, etc., to secure the maximum co-ordination and avoid duplication of effort.

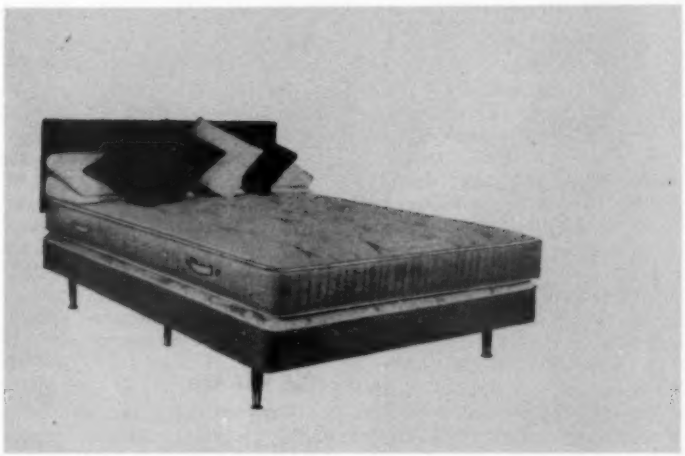
Members of the packaging technical committee are: Dr P. P. Hopf (chairman) — A. Boake Roberts and Co. Ltd.; C. T. Coward — Bakelite Ltd.; P. R. Hawtin — British Celanese Ltd.; G. Burke — British Resin Products Ltd.; J. Browning — British Visqueen Ltd.; D. J. A. Lee — BX Plastics Ltd.; H. Bing — Commercial Plastics Ltd.; T. W. Jackson — Lacrinoid Ltd.; A. V. Clark — May and Baker Ltd.; J. H. Brittain — The Metal Box Co. Ltd.; J. Carroll — Parnall and Son; J. A. Parker — Pure Chemicals Ltd.; Dr E. S. Narracott — Shell Chemical Co. Ltd.; G. E. Green — Telcon Plastics Ltd.; Dr E. M. Hunt — Utilex Ltd.; D. K. Taylor — Vinyl Products Ltd.; G. B. Hunneybell — Wallington Weston; and T. James — Whiffen and Sons Ltd. One member is to be nominated by The Barnet Comb Co. Ltd., and one by Williams (Hounslow) Ltd.

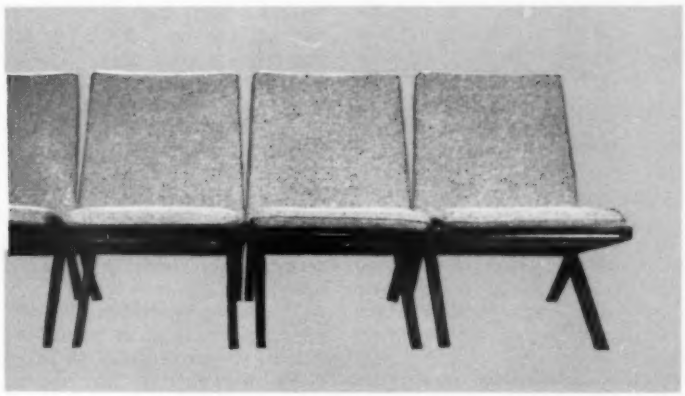
Plastics Limbs

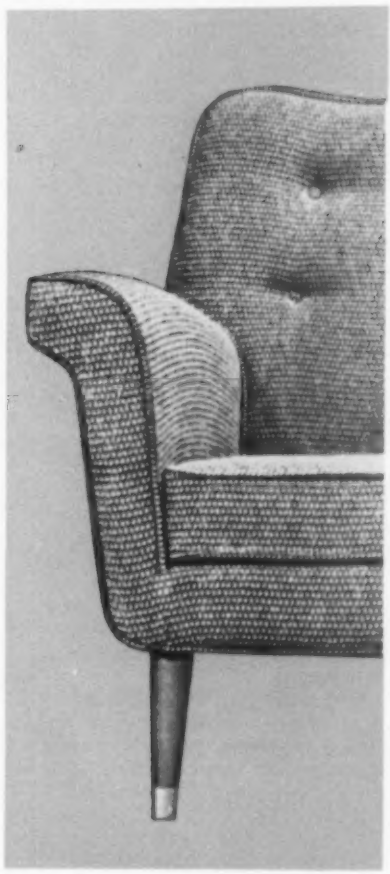
A new factory at the Irvine Industrial Estate, Scotland, is occupied jointly by Ideal Engineering Co. Ltd., a subsidiary of Hugh Steeper Ltd., makers of artificial limbs, Roehampton, and D.M. Industrial Plastics Ltd. of Walton-on-Thames. The two firms are working in close co-operation.

D.M. Plastics is experimenting in the manufacture of parts for artificial limbs, but is also making a wide range of grips, components and products for the radio and electrical industries.

INTEX IN FURNISHING







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Rubber's Accident Rate Up

IMPORTED INJECTION MOULDING MACHINES CRITICIZED

THERE was a sharp rise in the accident rate in the rubber and plastics industries in 1960, according to statistics published in the report of the Chief Inspector of Factories.

The year for industry as a whole was 'a bad one for industrial safety', says T. W. McCullough, the chief inspector. There were 190,266 accidents (9% up on 1959) of which 675 were fatal.

The rise in the accident rate is shown by accident incidence figures, which were introduced for the first time in 1959. They measure the number of accidents per 1,000 employees. Rubber manufacturing's figure was 22 per 1,000, higher than the average for all industry, which was 20.7 per 1,000. Although plastics moulders and fabricators still show a lower than average accident rate — 15 per 1,000 — the figure is a point up on the 1959 rate of 14 per 1,000. Rubber's rate for 1959 was 20, the industrial average for that year being 19.7.

Handling of Goods

All told there were 2,285 reported accidents in the rubber industry in 1960, of which five were fatal. (This is 18% up on the 1959 figure of 1,864 accidents, when, again, five were fatal). Hands suffered most — 704 cases of hand and wrist injury were reported.

The largest number of accidents — 638 or 29% — occurred during the handling of goods. Biggest culprit after handling was 'machinery in motion under power', which accounted for 348 accidents — 15% of the total. This was followed by 'struck by falling object' (216) and 'hand tools' (168).

Last year 1,144 accidents were reported by firms manufacturing plastics articles. One was fatal. Nearly 30% — 299 — were caused by moving machinery; the next largest category was handling (272 or 28%), followed by 'struck by falling object' (72 or 6%).

In the plastics raw material field there were 750 accidents, of which three were fatal. Here again handling topped the list (172 or 23%).

The report refers to 'substantial numbers' of injection moulding machines used in the plastics industry imported from Europe with guards that fall below British Standards. It stresses that all importers and prospective users should, in their own interests, ascertain the legal requirements before machinery is imported, advice on this being available from the Factory Inspectorate. In many cases, the report points out, the lower price of imported machines will be offset by the cost of safeguards which the user will subsequently have to provide.

'Similar difficulties', the report adds, 'may be experienced with blow moulding machines. This new process has already given rise to a number of accidents. Blow moulding machines were originally designed mainly for automatic working and under these conditions the operator need not approach the danger zone, which can be protected by a fixed guard. Difficulty arises, however, when the automatic methods break down and a system of manual operation is improvised which makes it necessary for the operator to put his hand between the moulds. Further, with larger articles removal of the bottle by hand is often the normal practice. The most satisfactory method of safeguarding these machines is by an interlocking type of guard such as is widely used on injection moulding machines'.

Ziegler Catalysts

A section of the report on chemical developments deals with the increasing use of Ziegler (aluminium alkyl) catalysts in the manufacture of stero-specific polymers. It draws attention to the hazards in the manufacture and manipulation of these alkyls, which are nearly all spontaneously flammable in air.

Plant has therefore to incorporate a fully effective inert gas purging system and multiple valving, the report says, so that some sections may be isolated and worked on without allowing oxygen into others. Aluminium alkyls also undergo explosive decomposition in contact with water; this must not be allowed near the plant, adds the report; in the face of hazards such as these, contamination of an operative's clothing must always be avoided.

Referring to foamed plastics, the report says that since polyurethanes are usually produced 'with tolylene diisocyanate as the cross-linking agent the high toxicity of the monomer makes it essential to carry out the process under effective exhaust ventilation. In the case of the rigid polyurethane foam plastics, various diisocyanates can be used, including diphenylmethane diisocyanate, which is far less volatile and therefore less toxic than the tolylene diisocyanate. The general trend with isocyanates manufactured for resin production has also been towards less volatile materials; thus, one of the isocyanate groups of the base isocyanates will react with the hydroxy group of a glycol to give a much larger molecule containing two or more reactive groups. Fairly stable trimers of the base isocyanates can be formed which still contain three functional cross-linking groups. These foams will bond to many surfaces, including metal, and can be sprayed or "spattered" on such surfaces, a process in which proper precautions against the toxicity of isocyanates must be taken'.

High Fire Risk

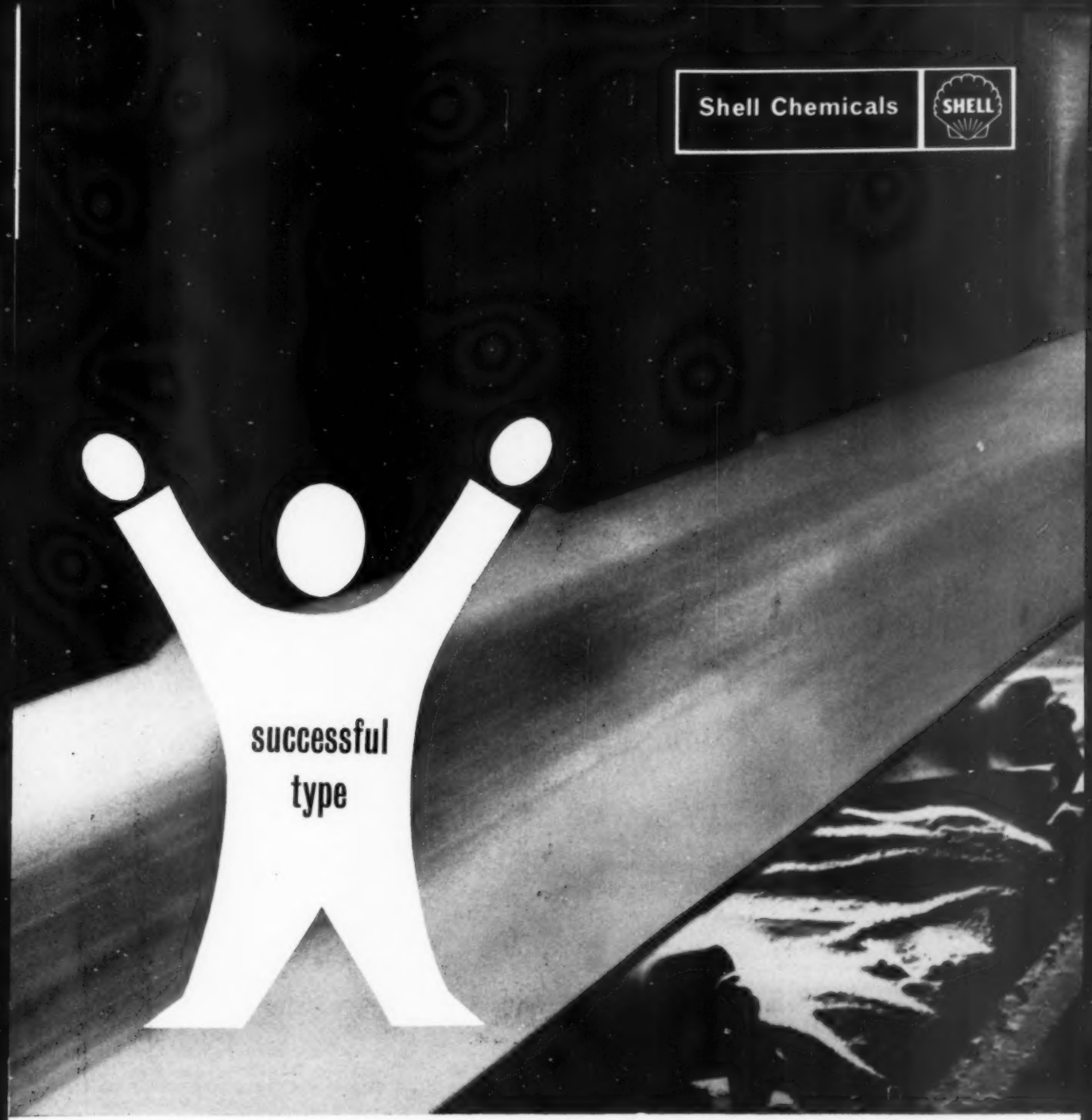
'With the major exception of polyvinyl chloride', the report states, 'plastics in their finished form also present a fairly high fire risk. Their flammability can, however, be reduced by several means, including the incorporation of chlorinated monomers in the parent polymer, the use of chlorinated organo-phosphates as plasticizers or of non-flammable inorganic salts which may be incorporated or used as a surface treatment. Where foamed plastics are used, care must be taken to prevent contamination with other materials liable to spontaneous ignition'.

The report is published by HMSO; concurrent with it is published the Annual Report of the Chief Inspector of Factories on Industrial Health.

A new use for Robinson Waxed Paper Co.'s Striplac silicone-treated paper is to protect the adhesive on these rubber pads for typewriter keys made by the Peerless Key Co.

Shell Chemicals

SHELL



Using 'Cariflex' S-1500 in formulations and mixing schedules recommended by Shell, conveyor belting has been successfully manufactured on a commercial scale to meet the stringent requirements of British Standard 490: 1951 for Grade A belting. Wherever strength, resistance to abrasion and a long, useful service life are important, 'Cariflex' is the right rubber for the job. Thus, 'Cariflex' types are widely used in tyre treads, hose, belting and other industrial moulded and extruded goods.

For further information consult your Shell Company (in the U.K., apply to Shell Chemical Co. Ltd., Plastics & Rubbers Division, 170 Piccadilly, London, W.1.)

Cariflex

TRADE MARK

SHELL-MADE RUBBER

NJIC Comes of Age

RUBBER'S 'MAGNIFICENT RECORD' — MINISTER OF LABOUR

THE Minister of Labour, John Hare, speaking at a dinner on the occasion of the 21st birthday celebration of the National Joint Industrial Council for the Rubber Industry in London on Tuesday September 26, congratulated the Council on its 'magnificent record' of not having had one official strike in the industry during its existence.

The dinner, held at the Guildhall and organized by the Rubber Manufacturers Employers' Association was a most impressive ceremony, attended by more than 400 past and present members of the NJIC and guests.

'The record of your Council', Mr Hare said, 'illustrates — in contrast to what many people would have us believe — how successfully our system of industrial relations in this country can, and does, work. Strikes and industrial unrest are, of course, news and, not unnaturally, it is they that fill the headlines. But how many people realize that last year, for instance, something in the region of 270 important claims for increased wages or shorter hours covering practically the whole of industry were settled peacefully? Less than ten resulted in dispute that led to strikes.

Taking Stock

'I make no apology for "blowing our own trumpet". Somebody must do this occasionally. The British have a remarkable ability to run themselves down. Yet we have a record which compares very favourably with that of other major industrial countries'.

But, the Minister pointed out, 21st birthday parties were not only a time for celebrating what had gone before. They were a time for taking stock. He said that there was no room for complacency: he was the last person to think that 'everything in the garden was lovely' as far as industrial relations were concerned.

Unofficial Strikes

Mr Hare cited unofficial strikes as an example. 'These represent probably the greatest weakness in our industrial relations system. They sap our economic lifeblood. They damage everybody — the employers, the workers themselves and the trade unions whose reputation and authority they undermine. It is not just the loss in production that is important, though when they occur in key sectors of industry their effects can be considerable. More important, in my view, is the fact that they breed acrimony and ill-will, and this in turn gives rise to persistent friction. We simply cannot afford bad relations between management and labour.

'It is often suggested that the way to deal with this problem is by legislation. I do not believe it. I do not think that in our free society, with our long history of the development of voluntary institutions, any attempt to impose constraint from the centre would achieve its purpose or, indeed, would even work at all'.

The Minister added that he was a believer in a more positive approach. When faced with trouble he believed in trying to find its cause and then by treating the cause preventing the trouble from taking place again. If the causes of friction on the factory floor could be found, if the attitudes of mind that set worker and employer against each other instead of helping them get together, could be exposed, the battle would be half won.

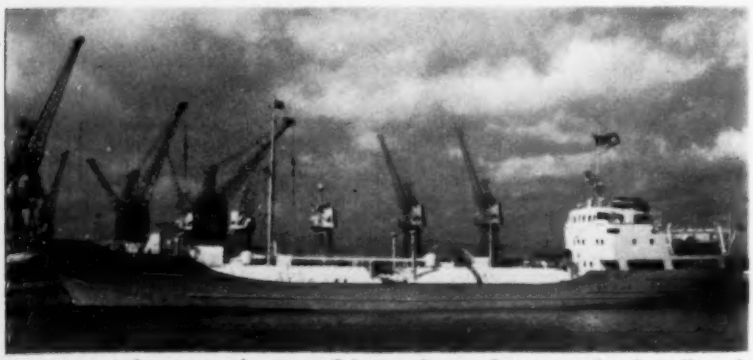
'It is primarily for industry itself to do this', Mr Hare stated. 'Your own industry has provided a very encouraging example. I am naturally thinking about the joint inquiry carried out earlier this year by the Dunlop Rubber Co. and the Transport and General Workers' Union into labour relations at the Dunlop factory at Speke. That was a case where labour relations had been deteriorating and a positive attempt was made by both sides to bring the causes into the light of day and to find a remedy for them. This is an outstanding illustration of the sort of enlightened attitude on the part of employers and trade unions that I should like to see spreading'.

Economic Medicine

The Minister referred to the 'economic medicine' that had been prescribed by the Government, stating that the Chancellor had not instituted a wage freeze. 'The trouble is that as individuals we have in recent years been taking too much out of the economy and putting too little into it. In 1960 to 1961 we paid ourselves out in increases in personal income no less than £1,450m. Yet in the same period production increased by only £650m. This does not make any sort of sense. So what the Government has asked is that there should be a pause in increases in dividends, salaries and wages to allow productivity a chance to catch up. At the same time the Chancellor announced important new proposals for improving the present "processes of consultation and forecasting with a view to a better coordination of ideas and plans". I believe that this is a lead to which men of goodwill can respond. The Government, employers, and trade unions have their own individual responsibilities. We should combine to try to work out together where it is we are going. I hope that both sides of industry will respond to this appeal'.

R. Davis, chairman of the NJIC, and Sir Thomas Williamson, general secretary of the National Union of General and Municipal Workers, responded. F. I. Tuckwell, chairman of the RMEA, proposed the toast of the guests, Lord McCorquodale, president of the British Employers' Confederation, responding.

Twenty-one on Tuesday — page 495.



After more than a year's successful experience of transporting butadiene in the special tankers for liquefied petroleum gases owned by A S Kosangas of Copenhagen, I.C.I. Heavy Organic Chemicals Division is now using the latest and largest vessel of the fleet — the 800-ton 'Lili Tholstrup,' see here at West Hartlepool. She is capable of refrigerating her own cargo

Q A CABOT

SRF Black from oil?

SRF

FACTS

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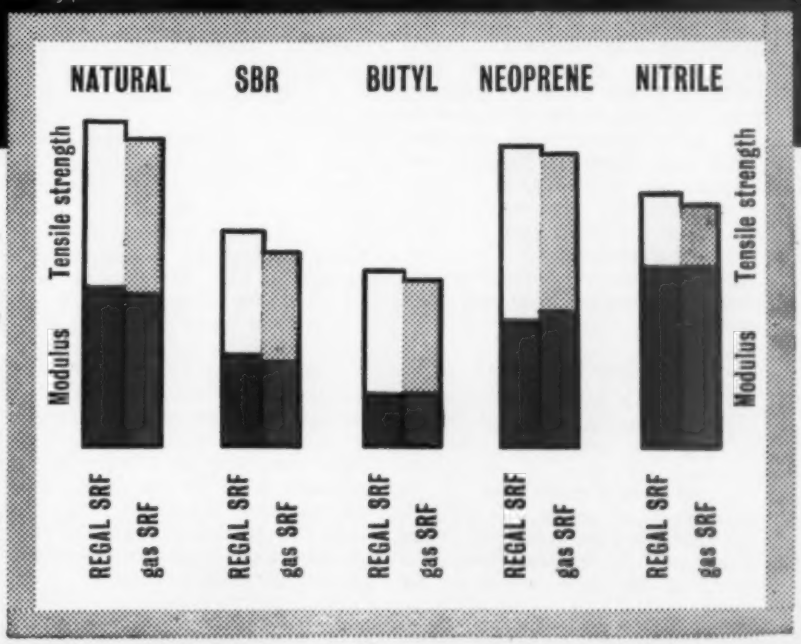

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PLASTICIZERS FOR PVC — PART 4

Commercial Plasticizers — 1

WIDE RANGE OF MATERIALS SOLD UNDER PROPRIETARY NAMES

By W. S. PENN, BSc

IN the modern technological world the description of intermediate chemicals is not always easy. Manufacturers, for obvious reasons, often prefer to disguise their products with proprietary names so that these must be used in text-books. Indeed some of the names become household words and are adopted generically by the industry.

Most of the pure chemical plasticizers are sold under their chemical names, sometimes with the addition of a trade name. However, it is where mixed plasticizers and plasticizers of rather indefinite chemical composition (polymerics and petroleum residues, for example) are used that the difficulties arise. In such instances it is impossible to avoid the use of proprietary names. It is hoped, but certainly not always implemented, that manufacturers will give some clue in the name to its composition. This enables some estimate of the properties to be made. A poor example (hypothetical) would be 'Pleoplex 104' and a good example 'Pleoplex Phthalate'.

A little consideration of the reasons for using proprietary names will explain some of the actions of the plasticizer manufacturers. There is no one plasticizer which has all desirable properties, so that blends of plasticizers or mixed esters are used to try and overcome the deficit. Phthalate 979/ME is a blend of phthalate esters and a good example of the process. Polymeric plasticizers are condensation products and have indeterminate formulae. Thus such names as Hexaplas and Paraplex are used. Also in this type of field are the relatively indefinite epoxidized products such as Abrac 'A' and Lankroflex ED.3. Such products as chlorinated paraffins and petroleum residues also need trade names.

British Plasticizer Industry

There are a number of companies in the UK manufacturing plasticizers for pvc who sell both proprietary materials and also the well-known chemical types of plasticizers. A very wide range of products is available and new types are continually being developed. All the plasticizers mentioned in the third article in this series (*RPW* September 23), are available from these suppliers as well as many others and individual manufacturers should be contacted for details. Table 1 gives a list of some of the plasticizer manufacturers in the UK.

TABLE 1
UK PLASTICIZER MANUFACTURERS

Company	*Trade Name*
Albright and Wilson Ltd.	NTP
A. Boake Roberts and Co. Ltd.	Abrac; Pliabrac
Briggs and Townsend Ltd.	Dioplate
British Celanese Ltd.	Celanese
Distillers Co. Ltd.	Bisoflex
Geigy Co. Ltd.	Reomol; Reoplex
Hercules Powder Co. Ltd.	Hercoflex
Howards of Ilford Ltd.	Plasticizer B.3
I.C.I. Ltd.	Hexaplas
Irano Products Ltd.	Iranolin
Lankro Chemicals Ltd.	Lankroflex
Petromar Ltd.	Ravolen
Scott Bader and Co. Ltd.	Crestapol
Shell Chemicals Ltd.	Dutrex

In addition to the products manufactured in this country there are some well-known plasticizers imported from the USA and some of these companies and the agencies which handle their products are given below: Bakelite Corp. — Bakelite Ltd. Carbide and Carbon Chemical Corp. — General Metallurgical and Chemical Ltd. Dow Chemical Co. — R. W. Greef and Co. Ltd. Golden Bear Oil Co. — Croxton and Garry Ltd. Hardesty Chemical Co. Inc. — Columbian International Ltd. Hercules Powder Co. Inc. — Hercules Powder Co. Ltd. Monsanto Chemical Co. — Monsanto Chemicals Ltd. Rohm and Haas Co. — Charles Lennig and Co. Ltd. Sharples Chemicals Inc. — Honeywill and Stein Ltd.

It will be found that many companies specialize in certain types of plasticizers for which they are very well known. In choosing a plasticizer supplier, therefore, it is advisable to be careful when making a choice from trade directories since many of the suppliers listed do not manufacture for the vinyl industry at all. To assist the user, the principal activities of some of the plasticizer suppliers in the UK are given in Table 2.

TABLE 2
SUMMARY OF PRODUCTS OF BRITISH MANUFACTURERS

Albright and Wilson Ltd.
Manufacture TXP, TIOP and NTP*. The latter is a proprietary phosphate without toxic properties.

A. Boake Roberts and Co. Ltd.
Manufacture most standard plasticizers; proprietary materials include Pliabracs* and Abracs*, the latter being epoxidized oils and esters.

Briggs and Townsend Ltd.
Manufacturers of Dioplates*, polymeric plasticizers based on adipates (linear polyesters).

British Celanese Ltd.
Manufacturers of trichlorethylphosphate* (TCEP) and epoxidized soya bean oil.

Distillers Co. Ltd.
Several common plasticizers of sebacate, adipate and phthalate type; TTP; esters of nonyl alcohol; caprylic esters; tributyl citrate; isodecyl alcohol esters; proprietary materials such as Bisoflex PCB* (high temperature plasticizer) and ODN (for low temperatures).

Geigy Co. Ltd.
Manufacture most standard plasticizers; Dinonyl and di-isodecyl phthalate; dinonyl sebacate; polyesters (based on sebacic acids) such as Reoplex 100 and 220; and special materials such as Reoplex 531* (polymeric); Reomol DV.50* (chlorinated extender).

Hercules Powder Co. Ltd.
Manufacture Hercoflex plasticizers; 707* high molecular weight monomeric; 290 di-(n.octyl-n-decyl) adipate for low temperatures (Hercoflex 90) secondary plasticizers Synthetics L1* and Metalyn.

Howards of Ilford Ltd.
DAP and DBP; a number of special plasticizers* mainly for films, coatings, lacquers, etc. The materials Howflex BB (di-(dimethylcyclohexyl) oxalates) CC (Tricyclohexyl citrate) and equivalent adipates and phthalates; SA, SB, SP and SS Sextol adipates, sebacates, phthalates and stearates (Sextol = mixture of isomeric di-methylcyclohexyl esters).

I.C.I. Ltd.
Polymeric plasticizers (Hexaplas PPA, etc.)* chlorinated paraffins and paraffin wax.

Irano Products Ltd.
Iranolins — petroleum derivative extenders.

Lankro Chemicals Ltd.
Many common plasticizers; dicapryl phthalate; di-isodecyl phthalate; butyl acetyl ricinoleate; Lankroflex ED.3* (epoxidized ester).

Petromar Ltd.
Ravolens — petroleum derivative extenders.

Scott Bader and Co. Ltd.
DAP; DNP; DIOP; Crestapol 932*— an epoxidized vegetable oil.

Shell Chemicals Ltd.
Dutrex* — petroleum derivative extenders.

*Described more fully in text.

Monomeric Plasticizers

The number of plasticizers manufactured under proprietary names is very great. It is, therefore, not possible in an article of this kind to describe them all and some choice must be made.

In making such a choice, the interests of impartiality must be kept in mind so that the present article gives a random selection of fairly well-known plasticizers which will illustrate the types of products available to industry. It should be stressed, however, that the omission of other products is no suggestion that they are not as good as those listed and no comparison is intended or implied. The prospective user should write to his preferred supplier for full details of the products available.

Subsequent sections deal with the monomeric plasticizers of Groups 1, 2 and 3. The next article in the series is a continuation of this list and gives the products of Groups 4 and 5. There are many of these since most of the polymeric plasticizers, for example, are relatively indeterminate products.

Group 1 Plasticizers

Phthalate 979/ME

This is a good example of a proprietary material made by A. Boake, Roberts and Co. Ltd. It is a blend of phthalate esters of Alphanol 79 and nonyl alcohol (3:5:5-tri-methylhexanol). This could quite clearly not have been called by its chemical name.

The plasticizer is very similar in all its properties to DOP, although it is different from dinonyl phthalate in a number of respects. For example, compounds containing it are more easily fluxed. An interesting difference concerns the viscosity of the plasticizer. The temperature viscosity graph of dinonyl phthalate exhibits hysteresis, which means that the viscosity temperature curve is different on cooling to that on re-warming — going up with decrease in temperature but not coming down so rapidly on re-warming. Phthalate 979/ME does not exhibit this phenomenon.

The plasticizer is also very useful in pvc paste resins for the production of plastisols and organosols.

Some comparative properties of compounds derived from Phthalate 979/ME and similar plasticizers are given in Table 3.

The similarity to Phthalate 79 and DOP is most marked.

The '79' Phthalates

A description of the '79' plasticizers was given in Article No. 3. Examples of these types include Phthalate 979/ME already described, Di-alkyl-Phthalate 79 made by Lankro Chemicals Ltd. and Lankroflex 29, a general purpose mixed phthalate ester made by the same company. In general, plasticizers of this type can be taken to have similar properties to the equivalent octyl ester.

Group 2 Plasticizers

Pliabrac 555

This is a general purpose primary phosphate-type plasticizer made by A. Boake Roberts and Co. Ltd. It is superior to the conventional aryl phosphate by virtue of its low temperature properties and stability to heat and light. At the same time it has the usual fire-resistance and ease of processing.

Pliabrac 555 is replacing TTP and TXP on an increasing scale. Like TTP it also has good tolerance for extenders and it is being used in floor coverings, carpet backing compounds, tiles, leathercloth, etc.

The heat stability properties are good and approach those of the higher alkyl phthalates. The initial colour of compounds is good and much superior after heating to the usual aryl phosphates.

Physical properties of compounds derived from Pliabrac 555 compared with equivalent plasticizers are given in Table 4.

NTP

This is a special phosphate plasticizer manufactured by Albright and Wilson (Mfg.) Ltd. It has low volatility, high flame resistance, non-toxicity and high solvating power. It gives compounds of good surface hardness and abrasion resistance and has good resistance to extraction by water and chemicals.

Its most outstanding property, compared with other phosphate plasticizers, is its non-toxicity. It is not suitable, however, for use by itself at low temperatures where it should be used in conjunction with other plasticizers.

Trichloroethylphosphate (TCEP)

This product is made by British Celanese Ltd. and has some most interesting properties. It is a more efficient fire-retardant agent than TTP or octyl diphenyl phosphate and 3-5% will often confer fire-resistance. It also confers good low-temperature properties and with low volume resistivity assists where antistatic properties are required. TCEP is a secondary plasticizer for pvc, being compatible to the extend of 15-20%. The plasticizer has some tendency above 180°C. to liberate HCl so that the choice of stabilizer is important.

Group 3 Plasticizers

The '79' Plasticizers

As with the phthalates, there are a number of '79' sebacate low temperature plasticizers.

A. Boake Roberts and Co. Ltd. market Sebacate 79 (also known as DA79S and Sebacate of Alphanol 79) as a substitute for DOS which it closely resembles. It is somewhat more compatible with pvc which makes it particularly suitable at very low temperatures.

Monoplex S.70 and S.73

These are two monomeric plasticizers sold by Rohm and Haas Co., the composition of which is not disclosed. However, they are both employed as low temperature plasticizers.

They both have good compatibility and quite low volatility, giving a

Continued on page 506

TABLE 3
COMPOUND PROPERTIES OF PHTHALATE 979/ME
(100 *parts Geon* 101 *and* 60*phr plasticizer*)

	Di-Nonyl phthalate	*Phthalate 79*	*Phthalate 979/ME*	*Di-2-ethyl hexyl phthalate*
Tensile strength, psi ..	2,323	2,191	2,290	2,261
Modulus at 100% elongation	1,950	1,333	1,465	1,577
% elongation at break ..	251	264	288	261
BS Hardness	43	55	49	49
Cold Crack Temp. °C. ..	—45	—55	—50	—55
Weight loss 48hr. at 100°C.%	2.0	2.2	2.1	2.8
Water extraction, 24hr. at 100°C., %	1.0	0.7	0.9	0.9

TABLE 4
COMPOUND PROPERTIES OF PLIABRAC 555
(100 *Geon* 101, 60*phr plasticizer and* 2*phr lead stearate*)

	Pliabrac 555	*TTP*	*TXP*	*DOP*
Tensile strength, psi	2,700	3,300	3,400	2,550
Modulus at 100% elongation ..	1,150	1,850	2,050	1,150
Elongation at break, %	300	290	280	355
Cold flex temperature, °C. ..	—16.5	—1	+1.5	—22.5
Weight loss, 24hr. at 85°C., % ..	0.7	0.39	0.32	0.55
Water extraction, 24hr. at 20°C., %	0.28	0.14	0.12	0.15

New Aspects in PVC

ALLIED STRUCTURAL PLASTICS INCREASED RANGE

THE Universal Asbestos Manufacturing Co. Ltd. has, since 1931, been manufacturing asbestos cement building products of many kinds. In 1957 UAM Plastics Ltd. started production of glass reinforced polyester translucent sheeting for lighting and decorative purposes. These sheets are produced in a wide variety of profiles to match other roofing materials and in a range of colours. Flat sheets and dome and barrel lights for flat roofs are also produced as standard items and special shapes and sizes can be made when necessary. One special contract recently completed by the company is an 'artificial sky' dome 25ft. in diameter made for research into lighting conditions by the Cambridge University School of Architecture (*RPW* August 5, 210).

More recently the group has further diversified its interests within the field of building materials by another entry into plastics. In January this year Allied Structural Plastics Ltd. was formed with UAM and Thermo Plastics Ltd. as equal partners to produce plastics materials for the building industry. The first product to be marketed by the new company was medium impact rigid pvc pressure piping sold under the trade name Aspect (*RPW* June 3, 828). This trade name is also used for the two newest additions to the range — pvc sheeting and rainwater goods.

Aspect pvc sheeting is produced in flat and corrugated form, the corrugated sheets being available to match 3in. and 6in. asbestos cement sheets, in lengths up to 10ft. Sheeting is also available in rolls 56in. wide and up to 30ft. long, transverse corrugated to the same profiles.

The range of rainwater components forms a complete system for pitched and flat roofs and for balcony drainage. These are made from unplasticized, unmodified pvc, the pipes and gutters being extruded and brackets and other fittings injection moulded.

All joints are of the push-fit or snap-fit type and the joints between lengths of gutter pipe are made at the brackets, which are supplied with a neoprene sealing strip fitted, no cement or caulking compound being needed. The system weighs only 1/5th as much as cast iron, is easily installed by comparatively unskilled labour and is being sold at prices competitive with cast iron.

In order to encourage the use of its products by the building industry the UAM group has, for several years, retained the services of an architect as a consultant. As a result of this the way in which information on the group's products is disseminated has been radically revised and the architect's point of view has been taken into account in the design of new components. This should ensure that the latest products are introduced to the building industry in a proper manner and that potential users are well informed on the advantages — and limitations — of what are still regarded by many of them as rather unconventional materials.

Allied Structural Plastics Ltd. is also one of the 16 founder members of the Plastics Pipe Manufacturers Society which has just been formed to ensure the highest possible standards of quality in plastics piping (see p. 497).

Kosmos 70 Price Reduced

Chance and Hunt Ltd. has announced reduced prices for its Swansea produced Kosmos 70 ISAF carbon black, which became effective on Wednesday (September 27).

The new prices are: min. 3 tons, 9½d. a lb. ex works; min. 1 ton, 9¾d. a lb. ex works; min. 50lb. bag, 10½d. a lb. ex store.

Ebonite Tank Lining

A NEW high-temperature hard rubber tank lining with a greater impact resistance and flexibility than other true ebonites is now being produced by Dunlop.

Developed by the General Rubber Goods Division, the material, known as Duraline, is particularly suitable for the lining of vessels for the transportation of liquids, or vessels which are subject to vibration and shock. It has been used in environments up to 105°C. continuously for considerable periods without deterioration.

No Ageing Problem

Unlike standard ebonites, Duraline does not harden in use, but softens slightly, resisting any tendency to become more fragile with age. It has a lower yield temperature than conventional ebonites and must be treated with greater care on flanges of vessels or pipes where bolting-up operations are to take place.

Duraline has been used for the lining of pipework to carry 45% sulphuric acid at up to 110°C. intermittently for over two years without deterioration, and for circuits containing phosphoric acid at 200°F. and to 28in. of vacuum.

It has also been used for the lining of chimneys carrying hot flue gases and in the dyeing industry to facilitate high temperature operations up to 95°C. combined with regular scouring using boiling water and steam.

From Colne to Nelson

In a little over ten years expansions in the oilsealing business of Pioneer Oilsealing and Moulding Co. Ltd. has meant two moves to larger premises.

The latest move takes the firm from Colne to premises twice the size at Barrowford, Nelson, Lancs. Telex has been installed, the number being 63122.

William Warne

William Warne and Co. Ltd., of Barking, Essex, has announced that the Abbey Road entrance to its factory is now closed to goods traffic. A new entrance in Gascoigne Road will be open from 7 a.m. to 6 p.m. Monday to Friday and 7 a.m. to 12 noon on Saturdays.

PLASTICIZERS FOR PVC

Continued from page 505

reasonable temperature range. In addition, both have good stabilizing properties, giving good resistance to heat and light.

Some comparative properties are given in Table 5.

The low temperature properties are very clear. At a reasonably low cost (compared with sebacates) they are well worth examining. The use of these plasticizers may also give a saving on the cost of the stabilizer.

TABLE 5
PROPERTIES OF MONOPLEX PLASTICIZERS
(100 *Polymer*; 67*phr Plasticizer* 1.6 *Stabilizer*)

	Monoplex S.70	*Monoplex S.73*	*DOS*	*DOP*
Hardness Shore A, 10sec.	67	65	63	70
Low Temperature Flexibility, C. ..	—48.5	—41.5	—56	—25
1% Soap Extraction in 24hr. 90 C. ..	8.4	9.4	1.0	7.8
Heat Stability	¼—3	¼—4	¼—¾	¼—¾

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VIEWS and REVIEWS

PERHAPS nothing in the field of plastics has given rise to more controversy than the very name 'plastics'. It used to be a pleasant sport to point out that many plastics were, in fact, not plastics at all, and, indeed, as a technical writer, I sometimes used to find it difficult to avoid confusion between a plastics and a material which exhibits plasticity.

There was even an occasion when I publicly suggested that in order to avoid this confusion we should call plastics 'plastix' and reserve the word 'plastic' for its purely technical meaning of possessing plasticity.

It is this property of plasticity, however, which gives rise to other difficulties, because it interferes with, disguises, other properties such as elasticity and even hardness.

The Hardness of Thermoplastics

Under the title, 'The Conception of Hardness as Applied to Thermoplastic Materials,' there is a discussion in *Industries des Plastiques Modernes* for August-September 1961, pp. 54-6, of some of the rheological problems involved in measuring some properties of thermoplastics.

The article contends that the usual methods of measuring hardness — Brinell, Rockwell, Vickers, Shore, Chevenard — are not suitable for thermoplastics, partly because they are subjective and do not measure a real property, partly because the degrees assigned to their scales are arbitrary, and partly because the scales are inconvertible one into another.

The author's chief contention is that they do not measure the property we want to measure.

The hardness of metals is related to their resilience, and it is also possible to establish a relationship between the hardness and the dynamic elasticity of rubbers, but no such relationship can be made out for the thermoplastics. What constitutes the hardness of thermoplastics and what we ought to try to measure is what the author calls 'transitory infra-viscosity', which he intends should connote the ideas of their sensitivity to temperature and humidity, and their chemical, inter-molecular structure.

The thermoplastic state is characterized by a visco-elasticity dependent on load and time of loading. Two types are to be distinguished: one in which large, more-or-less-elastic deformation occurs with increasing load up to the yield point, after which permanent deformation supervenes, while the rigid thermoplastics show a weaker deformation but reach a breaking point with, of course, a sudden yield.

Molecular structure is the prime factor determining hardness and two main classes of thermoplastics exist: linear, chain molecules and lightly-cross-linked, reticulated molecules.

Under load, the resin of linear molecules deforms comparatively easily because the molecular chains slip over each other longitudinally and transversely, while the reticulated resins, being held three-dimensionally, show greater resistance to deformation up to the point of rupture, behaving, in short, more like the metals.

Compression and Shear Apparatus

The author gives a description of an apparatus he has designed which is not so dependent as existing methods on load, degree of penetration, skill and experience of the operator, and is claimed to give, therefore, much closer repeat measurements.

Covering a circular hole, just over 1 sq. cm. in area, in a plate is placed a sheet 1mm. thick, of the material to be tested. From this sample, one seeks to punch out a circular disc, by pushing onto it a die of 1 sq. cm. circular area into the hole which is covered by the sample and has inside it a movable 'counter die', mounted on a calibrated spring.

Instruments measure and record the increasing load and the consequent deformation produced in the sample sheet. The apparatus can be maintained at and the test conducted at a standard temperature and humidity.

The test produces 'transverse decohesion' which is a close approach, says the author, to what we mean when we speak of hardness. It is a shearing and not a stretching, drawing, or tearing, although cold flow does occur and is measured micrometrically.

It is claimed that this test can show the effect of plasticizers, the degree of purity of the resin, the type of linking, and even more fundamental physical and chemical properties.

Growing Older

I make no excuse for returning to the topic of ageing because it is an outstanding problem commercially and technically.

It seems to me to have three main aspects: the fundamental one of what changes, physical and chemical, go on in a substance or an article during normal use; the development of an accelerated ageing test; and the practical application of the knowledge gained by these two approaches.

For different products, the problem of practical application is not couched in the same words or with the same intent: with some products, it may well be an objective to increase the life at whatever cost, with others it may be desirable to do so only if no extra cost be incurred, with others it may even be deemed best, if there is an economic advantage, to shorten the life, in a few cases it may prove possible to cheapen a product by increasing its potential life and then 'knocking it back' with a filler.

In practice, the choice from these is dependent to a large extent on achieving a satisfactory answer to the question: what test will give a sufficiently reliable estimate in a conveniently short time of how long an item will continue to perform adequately its intended function in actual service.

Ageing of Thermosetting Resins

H. Plasson, writing on 'Stability of Industrial Mouldings from Thermosetting Materials' in *Industries des Plastiques Modernes*, Vol. 13, No. 4, pp. 61-3, follows the usual lines of trying to establish a correlation between the period of natural ageing and the period required to degrade a sample to the same level or some other standard level by means of controlled heating in a laboratory oven.

He gives curves showing the losses in dimensions and weights of samples of phenol-, melamine-, and urea-formaldehyde resins filled with cellulose and wood flour, when heated to 100°C. for periods up to 150 hours. He reports also on the effects on shock and flex resistance.

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by F. C. JENNINGS

Not Yet Mastered

There are big differences between the five resins studied. In all of them the bulk of the losses had occurred in about 50 hours, the curves then proceeding asymptotically.

As is to be expected and as many of us have done in the same kind of investigation, he 'comes out by that same door wherein he went'. He claims to have established the correlation desired sufficiently close for practical purposes. This could mean 'rough and ready' or really valuable, and the clue to the exact meaning is to be found in his final comments.

I understand him to say that it still remains necessary to make a strict comparison or collation between the results of natural and artificial ageing, and that it would be imprudent to make an *a priori* assertion that such a correlation does indeed exist in all cases. More systematic, scientific knowledge is needed.

He concludes: 'These studies are like an instrument needed to give a knowledge of the stability and limiting conditions of industrial mouldings; but they do not give the complete answer. In every case, conclusions must be drawn only with prudence, and constant comparison made with the course of natural ageing. The problem is not simple: it has been asked since thermosetting resins began, some 40 years ago. It cannot be said to have been mastered yet'.

Ageing of Paint

Of course, ours is not the only industry interested in this subject. Making paint is another, and an article by C. A. Lominska in *Materials Research and Standards* Vol. 1, No. 8, pp. 620-4, deals with it, under the title 'Exposure Testing of Protective Paints for Metals'.

As a protection against corrosion, paints are best evaluated in three phases: preliminary laboratory tests, exposure tests, and service testing. Lominska's remarks at the beginning of his paper, on laboratory testing, are pertinent to my present purpose.

The laboratory tests 'include salt-spray, high-humidity, and temperature cabinets, immersion tests and artificial weathering machines. All of these tests are designed to accelerate film breakdown. Results obtained with these accelerated tests have generally shown poor correlation with performance in the field. Valuable information on certain specific properties can be obtained from them, but to date no accelerated procedures have been designed which duplicate the physical and chemical changes in a paint film that develop gradually in the field under actual weathering conditions. These changes as the film ages apparently have a profound effect on the ultimate performance of the paint'.

Engineering with Plastics

On October 31 and November 1 next, the Plastics Institute will hold a conference on Engineering with Plastics, and, quite by accident, I suppose, the papers in the August 1961 issue of its Transactions and Journal are also almost entirely concerned with the same theme.

They include four papers constituting an Extrusion Symposium and I propose to deal with them next week because they deserve extended comment. Now, however, I would like to deal with the last on the list, 'Some thoughts on the development of injection moulding materials' by G. Campbell, which alone of the seven and for a reason which is not immediately apparant, appears not in the Transactions but in the Journal part of the publication.

Perhaps it is put there because it is thought to be less of a contribution to new knowledge than are the other six (though that view could be held of at least two of the others). If this be so, and if it is thereby assumed that the paper is less valuable than the others, I would like to say a word in praise of review papers.

Value of Summaries of Existing Knowledge

It is my own opinion that, usually, no useful purpose is served by classifying and segregating technical papers in this way, while it often causes annoyance and sometimes hard words. We must remember too that review papers are likely to increase in number and prestige because specialization has gone so far that all of us need interpreters in order to understand what the workers in even neighbouring fields are trying to say.

I will go further and prophesy that a new profession may arise, that of the interpretive scientific expositor, who will aim at explaining new ideas, developments, and discoveries. All of us will use his services readily and unashamedly — we do now, in fact. His prestige is likely to be at least as high as that of a teacher which, in truth, he will be.

He will be of many types and he will use many techniques: words, pictures, diagrams; he will write, draw, and speak; he will employ the printed page, the lecture dais, the cinema hall, the radio set, and the television screen. He will be part technologist, part advertiser, and wholly public relations officer.

The Forest and the Trees

With him we will stand back while he demarcates the forest from all the trees.

Campbell's review paper on pp. 370-383 of the *Journal of the Plastics Institute* for August 1961, does just that. After an historical review of injection moulding materials, it ends like this: 'In a short period of time, injection moulding has progressed from the manufacture of small expendable personal articles, toys and minor electrical components, and has become an important supplier to almost all branches of industry.

'During ten years, injection-moulded kitchenware — bowls, buckets and food containers — has achieved at least parity with its traditional metal equivalents. Polymethyl-methacrylate injection mouldings have replaced glass in all automobile lighting other than head-lamp lenses and are battling with glass . . . in TV implosion guards. Nylon is in everyday use in gears, cams, bearings and other small mechanical parts and is attacking metal in large components such as marine propellers. Rigid vinyl, polythene and polypropylene pipe couplings, bends and tee-pieces are in everyday use in effluent and other drainage systems. . . .

'Thermoplastics are now available which should allow injection moulding to penetrate deeply into the major fields of transport, food distribution and building construction. . . .'

In such a passage resides one obvious advantage of the survey article — the summary which discloses the trend. It leads to the prime value and function of the review, the ability to see the next step more clearly. It is a springboard for action.

As Campbell demonstrates by saying in his present context: 'In 1939, injection-moulding equipment was in advance of the material then available; one is tempted to ask whether the position is not now reversed. . . .'

CHARLES JENNINGS

MEN and MATTERS

A Review of People and Events

by Peter Richards

THE foundation stone of the new extensions to the Shawbury laboratories of the Rubber and Plastics Research Association, was laid last week by P. W. Howard, president of the Research Association.

The ceremony was, by all accounts, blessed with very much better weather than was the case when the original laboratories were opened by HRH The Duke of Edinburgh in November 1954. That occasion was made even more memorable by the teeming rain which fell continuously during the day and threatened to wash away the marquee in which lunch was taken. After the ceremony, visitors' cars had to be towed from the flooded and sodden field by a local tractor.

Despite this somewhat inauspicious start the work carried out at Shawbury since then has been of a very high standard and of considerable value to the rubber industry.

Since the marriage of rubber and plastics research marked by last week's opening ceremony took place under an almost cloudless sky, this can perhaps be taken as a good omen for the future of the Research Association in its new task of serving both industries.

Best of Two Worlds

A few weeks ago I mentioned the ever-increasing range of patterns and colours available in decorative laminate materials such as Warerite and Formica. The ranges of both of these materials include several wood grain effects and news has recently reached me of an American manufacturer who has gone one better in combining a natural material with a synthetic.

Clear polyester film is being successfully bonded to plywood by a roll-laminating process to make decorative panelling. This is made by the United States Plywood Corporation using Videne polyester film developed by Goodyear. The resulting laminates, called Weldwood Permagard, provide wood grained panelling at considerably lower cost than high pressure plastics laminates. The polyester finish is stain and wear resistant and the panels are reported to have higher abrasion resistance than plastics laminates and to be suitable for working tops and for vertical surfaces.

The Grand Tour

Richard W. Malcolmson, automobile specialist and supervisor of the Detroit, Michigan, office of Du Pont's Elastomers Chemicals Department, has just spent a week visiting UK car manufacturers, and is now visiting car manufacturers in France, Germany, Italy and Sweden.

During his stay in the UK he was asked to give a talk to members of the non-metallic materials sub-committee of the Society of Motor Manufacturers and Traders. He said that synthetic rubber was finding increasing uses in American cars. More manufacturers were turning to neoprene for door and boot lid seals and ball joint seals. Hypalon sheathing was replacing pvc in wiring systems, particularly on commercial vehicles, and the use of Viton fluoroelastomer was increasing in fuel systems.

New Shell Plastics Manager

A. N. Holmes has been appointed general manager, Plastics and Rubbers Division of Shell Chemical Co. Ltd. He succeeds W. K. McGavin, who as a director of Shell Chemical Co., will be undertaking new responsibilities within the company.

Mr Holmes was educated at Wyggeston School, Leicester, and Christ's College, Cambridge, where he took a degree in natural science. He joined the Shell Group in 1937 as a chemist with the then Shell Marketing Company and was transferred to the Shell Research Laboratories in Amsterdam in 1939, where he worked on a petroleum chemical pilot plant. The invasion of Holland in 1940 put an end to this work and he was seconded to the Ministry of Home Security for a year on his return to the UK.

He was at Shell's refinery at Stanlow, Cheshire, for the remainder of the war and in 1946 went to Straits Settlements Ltd. in Singapore. After another tour of duty at Stanlow during 1947 he went to the US for a period of training and then returned to Stanlow as chief chemist at the new chemical plant.

In 1954 Mr Holmes was sent to Point Fortin, Trinidad, as refinery manager, and three years later returned to London as assistant

The Dumfries factory of The North British Rubber Co. held its first children's sports day recently—with a combination of excellent weather, side shows, Punch and Judy and pony rides. *(Top)* **G. H. Coston, factory manager, and Mrs Coston welcoming the 1961 Queen of the South and her attendants.** *(Bottom)* **The ponies of the Dumfries and District Riding Club made a great hit with the 250 children present**

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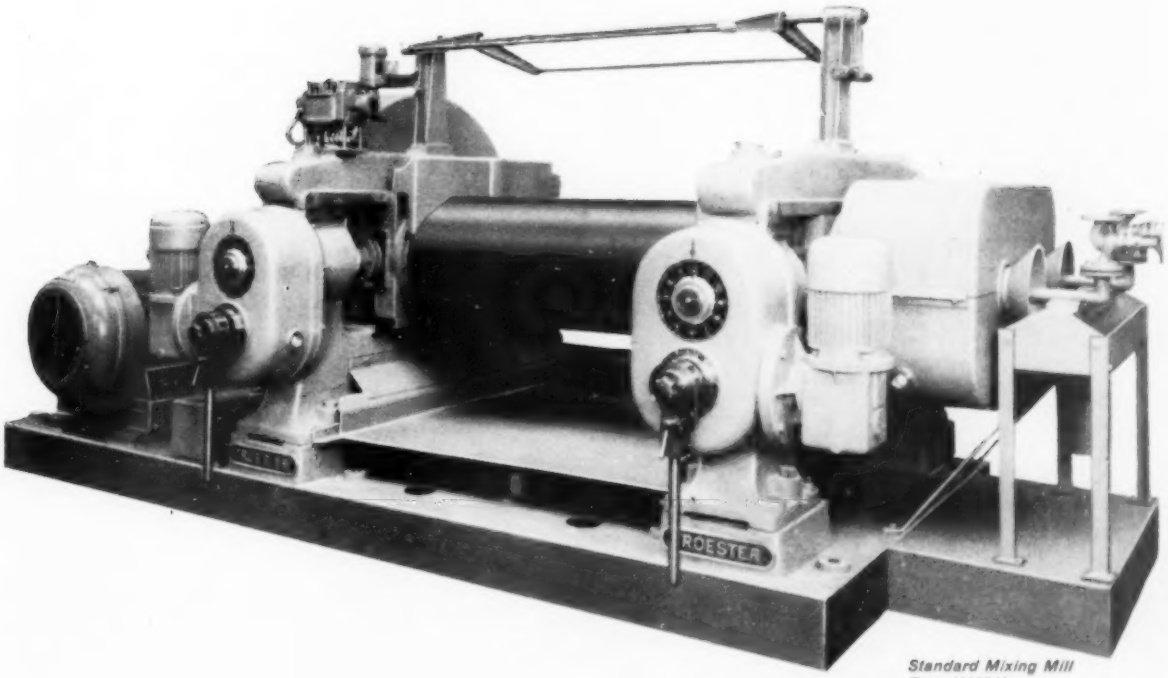

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manager of Manufacturing Operations Department, Shell Refining Co., a title he kept when that company's chemical manufacturing functions were taken over by Shell Chemical Co. in October 1958. Since January 1959 he has been manager of the company's Economics and Planning Department in London.

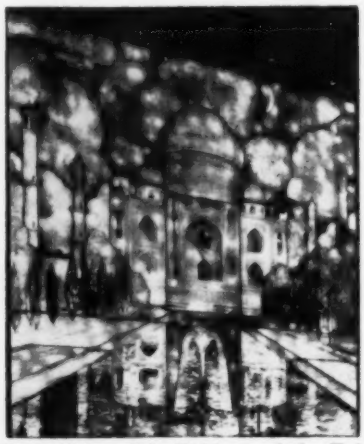
Launching Periods

The BB Chemical Co. Ltd. has created a new position: director of supply. The first man to occupy it is L. E. Puddefoot. Among his new functions he will be responsible for the purchasing activities of the company. Mr Puddefoot, who is 59, is well used to launching periods. He joined the company in 1931 to start chemical laboratories and to organize the technical and research side of the business. He was appointed a director in 1939, and technical director in 1944. He founded and led the research and development department, and his many responsibilities have included the production of newly-developed materials, inspection, safety and fire precautions.

He has represented BB Chemical on several Industrial Research Association and British Standards Institution Committees.

The Birds and The Bees

About 4m. people are expected to see the Blackpool Corporation's new seven-week display of illuminations which started this month.



This 60ft. x 40ft. Tableau of the Taj Mahal, which forms part of the illuminations at Blackpool, has been made from glass reinforced polyester resin *(See: The Birds and The Bees)*

This year a large proportion of the Council allowance for new features has been spent in the manufacture of spectacular set pieces and models from glass fibre reinforced with British Industrial Plastics polyester resin.

The toys of Toytown, the vividly coloured birds and bees specially designed to appeal to children, and hundreds of other small models, have been made by the Corporation from glass reinforced plastics. The toughness and durability of this material has also assisted the fabrication of larger illuminations such as the tableaux depicting the Taj Mahal, the Bay of Naples, New York and the Niagara Falls. The decorations must be strong enough to withstand all kinds of weather — one major problem is sand blast — yet light enough for easy handling. Another advantage of GRP for this application is that it is sufficiently robust for the models to be stored and used again in later years.

Appointment in Brief

Eric A. Falkner, formerly research manager, has been appointed to the board of Hairlok Laboratories Ltd., the design, development, research and testing division of the Hairlok Co. Ltd.

THE LEGAL ANGLE

Notices to Quit

By a Barrister

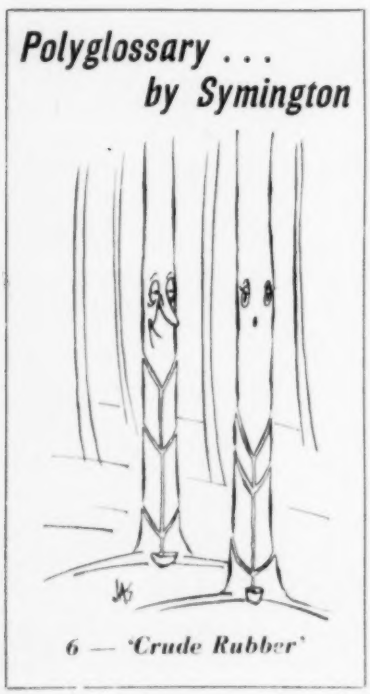
THIS column has explained that no court has decided whether or not a notice determining a contract of service must itself terminate on an anniversary of the commencement of that contract. And also, that most lawyers think that it need not. But now consider the same problem as it relates to notices to quit premises, and the answer is very different.

Suppose you build a factory and let out part of it, until such time as you wish to occupy it for yourself. If the letting is for a period certain, were it not for the 1954 Landlord and Tenant Act, no notice to quit would be necessary. The letting would expire by 'effluxion of time'. But under the 1954 Act, between six and 12 months' notice must be given — to terminate on a date not earlier than you could have got the tenant out, were it not for the Act.

This notice, of course, should be served by your lawyer. There is a prescribed form for it — and if you do not comply with the Act, the tenancy will continue. Also your lawyer will confirm that yours is one of the cases where you have grounds for opposing the tenant's application for a new tenancy — because, probably, you wish to use the place wholly or partly for yourself.

Now suppose that the premises were let for residential use. It may have been a letting 'from week to week'. Under the 1957 Rent Act, four weeks' notice at least will have to be given, even where it is a weekly letting. And where a notice to quit must be served, the requisite period must be given, to expire on an anniversary of the letting. So if it's a monthly letting, starting on the 1st day of one month, if you wish to determine it, you must give at least one month's notice, terminating on the correct date.

When we say 'you', we mean 'your lawyers'. The best advice we can give about notices to quit is to leave them to solicitors to deal with. If you wish to serve one, put the case in their hands. If you receive one, rush to them, with it, as fast as you can. It may cost you a little more initially — but there is a fortune for you to save in the long run.



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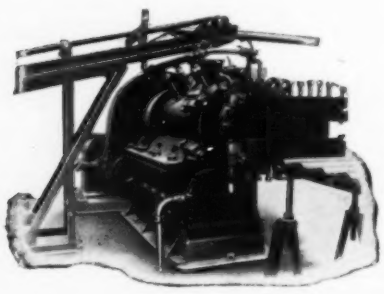

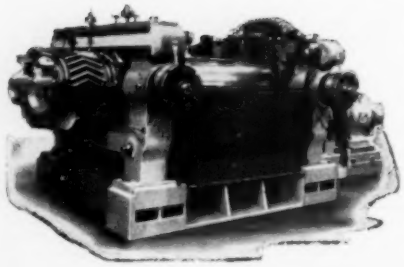

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RAPID BATCH PROCESSING OF SMALL PARTS

By JOHN SHEARING

THE best proof of any machine is a practical demonstration, and Guyson Industrial Equipment Ltd. did this very effectively at Interplas 1961. It was fascinating to watch busy executives queuing up with little bags of their own products which were rapidly cleaned on the new deflashing equipment. All were very much impressed.

There are two main types of equipment manufactured by Guyson. The first is Model T40 Guyrota, an automatic blast-cleaning machine and the second is the Guyson SBP/40 machine for the cleaning of articles which require individual treatment. Both of these machines have been well proved and are suitable for a wide variety of plastics.

Guyrota Model T40

This machine is designed to blast-clean quantity batches of relatively small parts without care or attention. A rotating basket enclosed in the cabin is motor driven to revolve it at low speed causing the parts to tumble while receiving a steady bombardment of abrasive or granules from the blast gun. This action causes all surfaces to be presented to the blast as the parts are tumbled about. The operator merely has to load the components into the basket outside the machine and then place it in the cabinet. Easy-fix location points facilitate the quick removal and refixing of the basket to the motorized turn-table which is reached through a wide-opening full length front door. The cabin is illuminated and the inspection window permits the process to be watched during treatment although this is hardly necessary. The tumbler basket is of perforated steel 20in. diameter by 11in. high of coned neck design. The rotating platform is driven by a 1/3hp motor through special reduction gear at 14rpm.

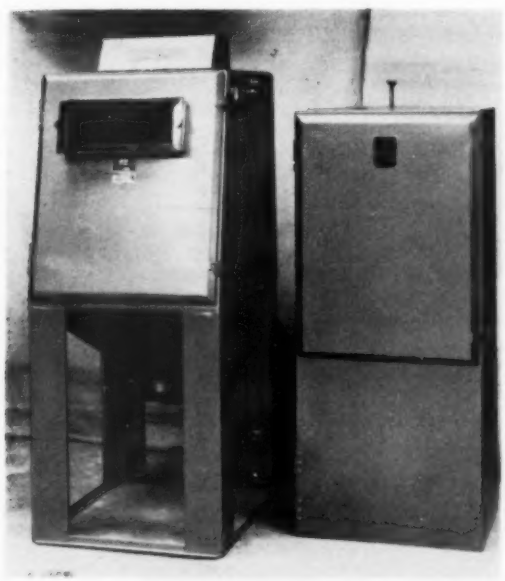
Operating Conditions

The machine is ideally suitable for small thermo-set type mouldings. It is possible to use either abrasive or special soft blast granules.

The period of surface treatment required is variable, depending on the nature of the material and size. The time is normally determined by an initial test run in the tumbler basket.

The size of parts can range from ½in. diameter to approximately 2in. diameter for effective treatment. The blast gun (No. 900) consumed approximately 23cfm at 80psi.

An extra tumbler basket is included to facilitate quick loading and unloading and the entire process is totally enclosed during operation to ensure hygienic conditions in compliance with the requirements of the Factory Act.



The Model T/40 Guyrota automatic blast-cleaning machine for batch processing small parts

The Guyson SBP/40

Many thermosetting plastics mouldings are unsuitable for bulk treatment because of their size and shape. This means that the flash has to be removed by hand which can be a long and costly operation.

Whilst still using a hand technique, the Guyson SBP/40 machine can effect a considerable reduction in trimming time. It does this by shooting non-abrading granules on the moulding at an impact force sufficient to remove flash at every point without otherwise damaging the moulding.

The machine is complete with motorized dust unit and rubber gauntlet gloves for the operator's use. The operator is seated at the machine with easy access to the interior of the cabinet through armholes at the front and with both feet conveniently placed to use the foot control pedals operating the blast gun and air jet respectively.

Special Features

The SBP/40 has a number of special features designed for efficient operation. The articles to be deflashed are introduced into the machine through the loading hopper and shute tray. The latter presents the parts to the operator at a convenient pick-up position inside the cabinet.

The inspection window ensures good visibility when handling the parts inside the machine and the domed rooflight assists in this. The side door opens the full width of the cabinet for easy maintenance of interior fittings. It may also be used for the introduction of larger mouldings for treatment which cannot be inserted through the loading hopper.

The sealed perforated floor of the cabinet isolates flash remnants from the blast granules in their re-circulation to the blast gun. The latter and the dust-off jet are mounted centrally in separate and adjustable support brackets.

The interior dimensions of the cabinet are 24in. x 32in. x 19in. and the overall height of the machine is 48in. The air consumed is at the

Continued on page 518

Pre-vulcanised Latex

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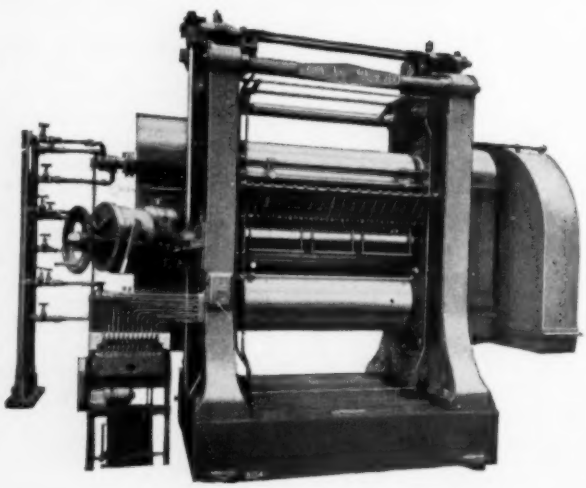


24" dia. x 68" face 3-ROLL EVEN and FRICTION SPEED RUBBER CALENDER, with Patent Nip Feed Guard, Circular Lubricating System from individually driven 12-point Forced Feed Lubricator with Self Filling Pumps. Mechanically Operated Elevating Unit for top and bottom Rolls. Variable Speed Drive to suit any requirement.

Plantation Newsletter

LEGISLATION TO CHECK RUBBER THEFTS

FROM KUALA LUMPUR

WHEN Malaya's House of Representatives meets on October 16, a new bill designed to check the great number of rubber thefts from estates will be introduced. For the past 18 months, a special Government Committee and legal draughtsmen have been preparing the bill and there appears little doubt that it will go through both Houses of Parliament with support from all sections of the community.

According to the United Planting Association of Malaya about $100,000 (nearly £12,000) worth of rubber is stolen every month from estates in the Federation. This figure is described as a 'very conservative estimate'.

Rubber stealing remains one of the biggest problems of estate managements and there is considerable anxiety here to see the new bill safely installed onto the Statute Book. Thieving of rubber in Malaya has not increased over the past year, but the position has not improved.

In Selangor State alone in 1960 — one of the 11 States in the Federation — 257 rubber thefts were reported. At present there is much confusion because of different legislation in each State, and only in two States, Selangor and Malacca, has a system of rubber inspectors been established to keep a watchful eye on rubber dealers. It is claimed that it is through some rubber dealers that stolen rubber finds its way onto the market.

Many estates have recruited additional watchmen but even so there have been isolated cases where these have been threatened with violence and intimidation. As one prominent planter said here recently: 'In 23 years as an estate manager it is only in the past 18 months that I have come across thuggery and violence on estates'.

According to the National Union of Plantation Workers, many of the thefts are the work of organized gangs of secret society thugs. The union claims that these people have gained influence through contract labour on estates.

The new bill is aimed at consolidating present regulations which differ in several States and it will provide for Federal instead of State control of the licensing of rubber dealers. In addition, it will call for the establishment of rubber inspectorates in every State and make provisions for stiffer penalties for rubber thieves and their accomplices. It has been stated officially here that the new bill will be a most comprehensive piece of legislation to deal with problems connected with rubber thieving.

Royal Photographs

Several reports have been received here of late of bogus Government officials going around estates — especially the isolated ones — selling photographs of His Majesty, the Yang di-Pertuan Agong and his Consort, the Raja Permaisuri Agong. These photographs are distributed free to anyone by the Department of Information.

by our
Malayan Correspondent

The new 'racket' is apparently proving to be quite successful for the operators who get hold of a group of innocent rubber tappers and tell them that it is an offence unless they purchase one or two copies of the royal pictures. Sometimes they charge the equivalent of 4s. a copy and sometimes as high as 7s. 6d. a copy.

For every picture bought, a receipt carrying the emblem of a sailing boat, similar to the symbol of the ruling Alliance Party in Malaya, is issued. It is chiefly women tappers who are picked on by the operators.

The Police and the Department of Information are now attempting to track down this gang of tricksters.

In the meanwhile, rubber planters have this week received a complimentary pat-on-the-back from the Commissioner for Road Transport, Mr R. R. Jackson, for their civic consciousness. Malaya is currently campaigning against the large number of diesel lorries which belch black smoke from their exhausts.

This is an offence and they can be prosecuted providing, of course, information is given to the Road Transport authorities. It is in this respect that the planters are helping. Many planters travel from their outlying estates into towns probably once a week and in the past few months they have made a point of noting the numbers of these lorries emitting excessive smoke and the places where the offences are taking place.

Said Mr Jackson: 'Rubber planters are doing a fine job in helping us to track down these nuisances'.

Rubber in Roads

Malaya's Minister of Works, Dato V. T. Sambanthan, has announced here that in future rubber is to be used in the building and maintenance of all roads in the Federation. He said that the use of rubber would improve Malaya's roads, generally considered good by international standards.

'For many years we have been experimenting with the use of rubber for roads and we have now come to the stage where we feel that rubber-mix is a decided asset', he added in a radio talk.

The Minister said that in the near future, all Malaya's roads would have superior qualities provided by rubber-mix. In the next four years, Malaya is to spend $550m. on roads, bridges and water supplies. A capital outlay of $90m. has been provided to build 1,200 miles of new rural roads, to add to the 7,000 miles of metal roads in this country.

Rubber Statistics

UNITED KINGDOM — CANADA

IMPORTS of all rubber into the UK during August amounted to 31,454 tons, according to figures issued by the Board of Trade. Exports totalled 4,690 tons. Detailed figures are as follows:

IMPORTS

	Aug. 1961	Aug. 1960
Nigeria	1,550	1,996
Singapore	5,483	5,143
Federation of Malaya	11,137	6,888
Ceylon	697	378
British North Borneo	282	119
Canada	1,670	2,132
Other Commonwealth countries and Irish Republic	541	133
Vietnam	1,805	115
Indonesia	911	764
USA	2,107	3,530
Other foreign countries	5,991	2,199
Total	31,454	23,397
Rubber latex	3,202	3,459
Other raw, including crepe	23,771	12,924
Balata	68	24
Synthetic rubber	3,593	4,767
Others	820	2,223
Total	31,454	23,397

EXPORTS

	Aug. 1961	Aug. 1960
Commonwealth countries and Irish Republic	985	1,659
West Germany	329	275
Netherlands	267	359
France	189	104
Spain	560	697
Other foreign countries	2,360	1,433
Total	4,690	4,527
Synthetic and reclaimed rubber	1,692	2,213
Waste rubber	2,998	2,314
Total	4,690	4,527

Canada

Consumption of rubber (natural, synthetic and reclaimed) increased in July for the third successive month, rising by 9.9% to 8,135 long tons from 7,401 in the corresponding month last year, according to the Dominion Bureau of Statistics. Decreases in the earlier months more than offset the increases, and consumption in the January-July period fell by 4.3% to 61,778 long tons from 64,529 a year ago.

BOOK REVIEW

Centenary Stimulation

RUBBER AND RAILWAYS IN THE NINETEENTH CENTURY

RUBBER AND RAILWAYS IN THE NINETEENTH CENTURY.—By P. L. Payne. Liverpool University Press, 1961, 246 pp. Price 30s.

The celebration of an important centenary is usually required before an industry becomes aware of its history. The centenary of Goodyear's discovery of a method of vulcanizing rubber was a useful stimulus for the historians of the rubber industry, and there is every sign that the centenary of the British plastics industry to be celebrated in 1962 will be the occasion of some historical reviews.

The rubber industry was well served by the 'History of the Rubber Industry', edited by Schidrowitz and Dawson, and published by the IRI in 1951. There have since been a number of books relating particular aspects of industrial history as it concerns rubber manufacture. The present volume completes a survey of the early history of Spencer, Moulton and Co., started last year in Professor Woodruff's 'The Rise of the British Rubber Industry in the Nineteenth Century'. There we were able to follow the story of Stephen Moulton's search for success as a rubber manufacturer in the face of considerable opposition from both Hancock and Macintosh. 'Rubber and Railways in the Nineteenth Century' traces the growth of George Spencer and Co. until their fusion with Stephen Moulton in 1891 and presents an interesting picture of the industrial methods of the nineteenth century. The secrets of Spencer's success as a supplier of the then revolutionary rubber springs to the railways of Britain and Europe, were undoubtedly in the design of the springs, and in the quality of the rubber manufactured by Moulton. The difficulties that beset the manufacturers and middlemen of that period were no less than those which face modern manufacturers. In particular, we find that Spencer was continually being subjected to pressure in respect of prices by the railway engineers on one hand, and by Moulton on the other. This was at a time when the ironmakers were making significant improvements in the quality of their products, in answer to the competition from the rubber spring, and it is to Spencer's credit that the rubber spring survived so dramatically to provide a basis for the mechanical rubber industry of today. Mr Payne refers to the Railway Age as momentous, and as far as the rubber industry is concerned it was certainly an age of growth and discovery.

This book is carefully annotated and indexed and can be recommended to any readers interested in the history of the UK rubber industry. J. A.

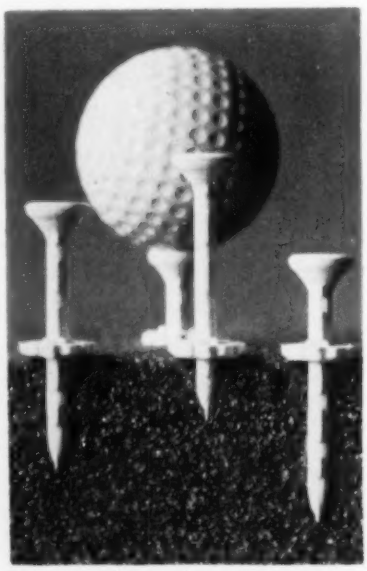
Acheson Dispersed Pigments

Cabot Carbon Ltd., of Stanlow, Ellesmere Port, has concluded an agreement with Acheson Industries (Europe) Ltd., of 1, Finsbury Square, London, by which Cabot will purchase the business and manufacturing facilities of the Acheson Dispersed Pigments Division situated at Dukinfield, Cheshire.

Although this was correctly reported in our September 9 issue (392), it has been pointed out that the headline — 'Acheson Taken Over by Cabot' — could possibly be misleading. It is stressed that the transaction is limited to the Acheson Dispersed Pigments Division.

Entire Face

An original equipment tread design extending across the entire face of the tyre will soon be available for the first time in the US retreading industry, according to J. E. Hynds, Firestone Tire's manager, treading and repair material sales.



This American adjustable golf tee, which allows golfers to position the ball at exactly the same elevation for every drive, is moulded of Eastman's Tenite butyrate. Each tee has a detachable collar which slides on to the notched shaft to any one of four desired positions. The position is set by twisting the collar a quarter turn to the right, and is just as easily changed by reversing the turn and resetting

PLASTICS MACHINERY DEVELOPMENTS

Continued from page 515

rate of 20cfm at a pressure of 100psi. The granules are constantly re-circulated so that replacement is only required at infrequent intervals.

Conclusions

The Guyson machines have been designed to give maximum comfort and efficiency to the operator. They are also as fool-proof as possible so that in the main it is possible to use unskilled labour.

The abrasive particles are only used for cleaning metal and for plastics non-abrasive granules are employed which do not damage the surfaces.

The machines are particularly designed from the hygienic point of view. They comply with all the requisite factory regulations, which is of great importance since nowadays all blasting equipment of this type must be totally enclosed. The users of Guyson equipment, however, need do nothing about this aspect at all since the machine is ready for use without difficulty.

COMPANIES in the NEWS

Pataling Rubber Estates

The directors have declared an interim dividend for the financial year ending October 31 1961 of 12½% (3d. per 2s. share) less income tax at the rate of 7s. 9d. in the £, payable on October 20 1961.

British Rubber Estates of Java

British Rubber Estates of Java propose to redeem the whole of the outstanding debenture stock (£5,296) with a premium of 10% and accrued interest to September 30 1961 (in arrears since January 1 1957). The payment is to be made on September 30.

Universal Asbestos Interim Dividend

The board of the Universal Asbestos Manufacturing Co. Ltd., in announcing an unchanged rate of interim dividend of 5% on the capital, increased by a one-for-four scrip issue in March last, state that it is not intended to imply the maintenance of the same total rate of dividend as in the previous year. It is solely to reduce the disparity between the interim and final dividend payments.

The company says that it continues to trade satisfactorily and present indications are that the profits for the current year will be 'somewhat in excess' of those of the previous year.

Reichhold Chemicals Ltd.

Reichhold Chemicals Ltd. has declared an interim dividend on the ordinary share capital of the company of 7½% equal to 4½d. a 5s. share less

IRI GOLF

H. W. West wins Bridge Trophy

MANCHESTER SECTION AT ROCHDALE

THIS year the Manchester section of the Institution of the Rubber Industry Golfing Society returned to the Rochdale Golf Club for its competition for the Bridge Trophy.

Weather conditions were ideal, the members playing in sunshine throughout the whole of the day.

Thirty-four members took part in the competition, which was won by the oldest member of the section, H. W. West, who turned in a net score of 68 — five shots less than his age.

The runner-up was L. R. Allanby, with a net score of 70, playing off a handicap of 5.

K. Bradshaw, of David Bridge and Co. Ltd., presided over the dinner in the evening, presented the trophy to Mr West and also gave 13 other prizes to the following members: H. W. West 83−15: 68; L. R. Allanby 75−5: 70; A. W. Ayres 85−14: 71; G. Robinson 82−10: 72 (35); E. Morris 91−19: 72 (36½); S. Diggle 76−2: 74; C. G. Follett 92−17: 75 (34½); A. Lord 91−16: 75 (36); S. Heywood 84−9: 75; E. Cheetham 86−10: 76; A. Sanders 96−18: 78 (35); A. Tonge 87−9: 78; and K. Bradshaw 114−24: 90.

Mr Bradshaw himself took the special prize with a net score of 90.

Thanks are due to David Bridge and Co. Ltd. for providing the meal, the cup and other prizes. The section also thanks the following for the donation of prizes: Mr Hunt, David Bridge and Co.; Mr Heywood, Alfred Smith Ltd.; Mr Sanders, Rubber Regenerating; Mr Savaage, Anchor Chemical Co.; Mr Liddiard, International Synthetic Rubber Co. Ltd.; Mr Birkitt, Hubron Rubber Chemicals; Mr Cheetham, Whitehead Chemical Co.; Mr Ayres, British Titan Products; Mr Senior, West and Senior Ltd.

Age is obviously no problem to the winner of the Manchester section's Bridge Trophy — 73-year-old H. W. West is presented with the cup by K. Bradshaw of David Bridge and Co. Ltd.

The Manchester section after the match at Rochdale

London Section Sorbo Bowl

THE London section of the IRI Golfing Society held its last day meeting of 1961 at Coombe Hill Golf Club on September 20.

The morning competition was for the Sorbo Bowl which was won by R. McEwan with a total of 36 points, the runner-up being H. Hardman with 34 points.

In the afternoon there was a four ball better ball Stableford competition which was won by I. Keith and A. M. Keith with a total of 41 points.

Although the weather could have been kinder it was a most enjoyable meeting and the London section expressed its thanks to the secretary and staff of Coombe Hill Golf Club.

PI NEWS

COPIES of the programme booklet for the coming session are available from the Secretary, the Plastics Institute, 6 Mandeville Place, London, W.1.

Courses on plastics technology and allied subjects being arranged by technical colleges during session 1961-62 have been published in the August 1961 issue of the Transactions and Journal of the Plastics Institute. Copies of a reprint may be obtained from the secretary.

Safety

A two-days course on safety in the plastics industry, for supervisors and charge hands, will be held on December 5 and 6 1961, at the Industrial Safety Training Centre in Birmingham. Registration forms may be obtained from the Secretary of the Institute or the Director, Birmingham and District Industrial Safety Group, 22 Summer Road, Acocks Green, Birmingham 27.

Education Fund

New awards have been made for 1961-62 from the Education Fund for the following courses.

Borough Polytechnic

One 1-year postgraduate course for the API — £300; one 4-year sandwich course for the Diploma in Technology — £200 pa; one 2-year course for the Diploma —£100 pa; PIEF prizes for students — £100; PIEF bursary fund — £200; PIEF travel fund — £100.

College of Advanced Technology, Birmingham

Two 4-year sandwich courses for the Diploma in Technology — £225 each.

Brunel College of Technology, Acton

Two 1-year postgraduate courses for API — £240 each.

National College of Rubber Technology

One or more scholarships for 1-year postgraduate course for API —£480.

IRI NEWS

Rubber in Astronautics

The first lecture of the 1961-62 programme was given recently at the Royal Station Hotel, Hull. This was a joint IRI/OCCA lecture and Dr Langton of the National College of Rubber Technology spoke on 'Rubber in Astronautics'. A most interesting talk, it was followed by W. H. Stevens introducing two films made by the Thiokol Corporation, 'Packaging Rocket Power' and 'The Minuteman'. These colour films were eye-openers and the audience was most impressed by the massive effort being put into the rocket and missile industry.

The next lecture will be on Thursday October 26 at 7.45 p.m. at the Yarborough Hotel, New Holland. P. E. Davies of Esso, will speak on 'Recent Developments in Chlorbutyl Rubber Technology'.—J. H. C.

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

THE hatches remained battened down in the stock market during the past week or so. Brokers on the whole found business difficult again and orders generally were few and far between. Share prices moved within narrow limits and it took very little to tip the trading scales one way or the other. Generally speaking, however, the undertone along Throgmorton Street stayed fairly steady despite the drag of the international political situation. However, the outlook seems as clouded as ever and I for one do not regard the outlook from an investment point of view as particularly rosy although at the same time there are no real indications that things will go much lower. What is really needed, of course, is some pick-up in the way of fresh business. So far the buyers have been content to stay on the sidelines. The big institutions have quite a good deal of their spare cash already counted for in the recent spate of 'rights' issues. As we pointed out here just recently the queue of companies with plans for raising new capital has been growing and will continue to lengthen as the credit squeeze takes its toll.

LAPORTE INDUSTRIES was one well-known name in the chemical field which announced recently that more money was to be raised. The amount involved in this particular instance is £4,800,000 with shares being offered on a one-for-five basis at a price of 18s. Laporte apparently is having the same experience as other chemical manufacturers. Currently trade is less satisfactory in some companies of the group. Competition has increased and profit margins have narrowed. The capital programme for which the new money is required is due for completion by the end of 1964.

LINTAFOAM has also laid plans for the raising of more £ s. d. In this particular instance new shares are going on sale at 8s. each on a one-for-four ration. Meantime the directors have produced very good profits which have expanded from £69,268 to £134,776. As forecast, the dividend is 30% against last year's total of 10%.

The chairman reported that the current financial year has opened satisfactorily. Exports, he pointed out, now account for an increasing proportion of the company's production. It is a part of the business that directors are trying hard to widen. They think that the Chancellor's measures must tend to restrict demand for a time in the domestic market but they also believe that their plans for widening activities will provide them with the scope to hold and possibly increase earnings through this difficult period.

Most market operators were disappointed with the same again effort

Continued on page 521

Share Price Movements

Par Value	Company	1961 High	Low	Sept. 16	Latest
£1	A.E. Ind. Ord.	48/6	34/9	38/3	35/-
5/-	Albright & W. Ord.	29/6	22/3	23/-	22/3
£1	" " " 5% Pref.	17/3	13/-	13/-	13/-
5/-	Anchor Chemical Ord.	25/6	16/-	17/9	18/6
4/-	Airfix	64/6	34/6	62/3	64/3
4/-	" Non Voting	59/6	33/6	58/9	59/6
5/-	Andersons Rub. Ord.	—	—	3/9	3/9
£1	Angus Geo. Ord.	83/-	58/6	66/-	66/3
5/-	Ault & Wiborg Ord.	17/-	12/9	13/9	14/9
£1	Avon India Rubber Ord.	46/6	30/-	36/9	36/9
£1	" " " 6% Pref.	19/3	17/6	17/6	17/6
10/-	Bakelite Ord.	66/3	42/3	47/-	46/6
£1	" 6% Pref.	19/3	16/6	17/-	17/3
£1	Baker Perkins Ord.	59/6	40/6	47/-	47/3
4/-	Bank Bdg. Rubber Ord.	3/6	1/9	2/3	2/3
4/-	Bettix	11/9	7/6	9/-	9/-
4/-	Brammer H. Ord.	17/-	13/9	13/9	13/9
10/-	Bridge, David Ord.	60/-	28/9	28/9	31/3
5/-	Bright, John Ord.	9/6	6/3	6/6	6/6
5/-	Brit. Blting. & Asb. Ord.	24/-	17/6	19/3	19/3
£1	" " " " Pref.	—	—	13/3	13/3
5/-	British Electronic Indus.	15/6	9/6	11/6	11/-
£1	BICC Ord.	62/6	49/-	59/-	57/6
5/-	BTR Ind. Ord.	18/9	9/6	9/9	9/9
£1	" " 7½% Pref.	21/6	19/9	20/-	20/-
10/-	Castrol Ord.	52/-	37/-	41/-	39/-
£1	Courtaulds Ord.	47/6	32/6	34/6	33/3
£1	" 5% 1st Pref.	16/-	13/9	13/9	14/-
£1	" 6% 2nd Pref.	18/3	15/9	16/-	16/3
4/-	Cow, P. B. Ord.	10/6	7/6	9/3	9/-
£1	" " 5% Pref.	14/3	12/6	13/-	12/6
1/-	Dannimac Mfg. Ord.	15/3	10/6	11/-	11/-
10/-	De La Rue Ord.	70/-	51/-	53/9	52/6
£1	" " " 3½% Pref.	10/6	9/6	10/6	10/-
10/-	Distillers Co. Ord.	41/3	31/-	37/-	36/6
£1	" " 6% Pref.	20/3	17/-	17/6	17/3
£100	" 5% Conv. Loan	£96	£90	£91	£91
£100	" 5½% Unsec. Loan	£86½	£72	£74	£73
10/-	Dunlop Rubber Ord.	29/-	21/6	26/9	26/-
£1	" " 5½% Pref.	16/-	13/9	14/6	14/-
£100	" 3½% 1st Debs.	£69	£67	£68	£68
£100	" 4½% 2nd Debs.	£79	£74	£75	£75
£1	Eng. Elect. Ord.	40/6	28/3	30/-	28/3
4/-	Ebonite Cont. Ord.	8/6	5/9	6/-	6/-
£1	English China Clays Ord.	117/6	80/-	97/3	96/9
£1	Goodyear Tyre 4% Pref.	11/6	9/9	10/-	10/-
5/-	Greeff Chem. Ord.	37/6	22/9	24/-	23/-
10/-	Greeff Chem. 5½% Pref.	8/3	6/9	7/3	7/-

Par Value	Company	1961 High	Low	Sept. 16	Latest
4/-	Greengate & Irwell Ord.	6/9	4/9	4/9	5/9
5/-	Hackbridge Hldg.	6/9	4/9	6/-	6/-
£1	Harrisons & Crosfield Dd.	57/6	47/6	48/9	48/-
1/-	Hunt & Moscrop Ord.	2/3	1/3	1/9	1/10½
£1	Imp. Chem. Ord.	81/6	63/-	68/9	64/3
£1	" " 5% Pref.	16/3	13/6	14/6	14/9
£100	" 4½% Unsec. Loan	£83	£76½	£79	£77
£100	" 5½% Conv. Loan	£93	£86	£87½	£88
5/-	Laporte Ind. Ord.	30/9	19/6	22/9	20/3
£1	" " 7½% Pref.	23/-	20/-	20/-	20/-
£1	Leyland & Birm. Rubber Ord.	59/3	42/6	48/-	43/9
£1	" " " 6% Pref.	18/9	15/-	15/-	15/-
2/-	London Rubber	15/6	9/6	13/-	12/9
£1	" 6% Red. Cum. Pref.	20/-	16/9	17/6	17/6
£1	McKechnie Bros. Ord.	43/-	27/-	40/6	40/6
£1	" " 'A' Ord.	45/-	35/-	35/-	35/-
£1	" " 6% Cum. Pref.	18/-	16/-	16/6	16/6
5/-	Monsanto Chem. Ord.	27/6	16/-	17/6	16/6
£1	" " 3½% Pref.	12/6	10/9	11/-	11/-
£100	" " 6% Debs.	£98	£88½	£89	£89
5/-	Miles (H.G.) Hldgs. Ord.	7/9	7/-	7/6	7/6
2/-	Movitex	7/6	4/9	5/-	5/-
£1	North British Rubber	21/3	12/-	12/6	12/6
5/-	Northwestern Rubber	13/-	9/-	12/-	12/-
5/-	Plastic Enginrs. Ord.	40/-	28/6	28/6	28/6
10/-	Projectile & Eng. Ord.	50/6	22/6	38/9	38/9
5/-	Redfern Holdings Ord.	3/9	2/9	3/3	3/3
2/-	RFD Ltd. Ord.	6/3	3/6	4/6	4/3
£1	" " 5½% Pref.	15/-	10/6	11/3	10/6
2/-	Rubber Imp. Ord.	6/3	3/3	3/6	3/3
2/-	" " 'A' Ord.	5/-	2/6	3/-	3/-
£1	" " 5% 1st Pref.	13/3	11/3	12/3	12/3
5/-	Rubber Reg. Ord.	18/3	13/6	14/6	13/6
4/-	Shaw Francis Ord.	24/6	13/9	14/-	13/9
£1	Shell Ord. (Reg.)	140/-	108/-	113/3	115/6
2/-	Silentbloc Ord.	10/6	8/3	8/9	8/6
5/-	Storey Bros.	46/-	34/-	35/-	35/-
2/-	Sussex Rubber Ord.	2/7½	1/9	1/9	1/9
5/-	Sutcliffe Speak Ord.	18/6	12/6	12/6	12/6
£1	Tootals	35/6	27/-	27/6	27/3
£1	Turner & Newall Ord.	78/-	55/-	63/3	61/3
£1	" " " 7% Pref.	21/6	19/-	20/3	20/3
5/-	Universal Asbestos Ord.	27/-	20/-	23/-	21/3
£1	Venesta Ord.	76/-	57/6	60/-	58/-
5/-	Viscose Dev. Ord.	16/3	13/3	13/9	13/9
5/-	Warne W. (Holdgs.) Ord.	21/6	14/9	18/3	17/6

Rubber Markets

LONDON

Prices had a sagging trend. There was insufficient demand to resist the influence of lower Eastern levels but although prices were marked down there was little evidence of selling pressure. Factory orders were of a selective nature and terminal activity was mostly confined to covering against sales made recently.

Latest prices are as follows:
No. 1 RSS Spot: 25d.-25⅛d.

Settlement House:
November 25d.-25⅛d.
December 25d.-25⅛d.
January 25⅛d.-25⅜d.
January/March 25⅛d.-25⅜d.
April/June 25⅛d.-25⅜d.
July/September 25⅛d.-25⅜d.

No. 1 RSS cif basis ports:
October 24⅞d.-25⅞d.
November 24⅞d.-25d.
December 24⅞d.-25d.

Godown:
October 83¼ Straits cents.

LATEX

Centrifuged 60% latex per gallon in drums, seller, September, October, 14s. 3d., cif European ports. Spot, seller, 14s. 9d. Bulk, seller, d.w. 14s. 2d. Normal, seller, September, October, 11s. 1d.

NEW YORK

The New York rubber market ruled as under on September 25:

DEALERS' PRICES

	US cents per lb., ex-dock Sept. 25	Previous
No. 1 RSS, Oct.	29⅛b–29⅛a	29⅛b–29⅛a
Nov.	29b –29⅛a	29b –29⅛a
No. 2 RSS, Oct.	29⅛b–29⅛a	29⅛b–29⅛a
Nov.	28⅞b–29⅛a	28⅞b–29⅛a
No. 3 RSS, Oct.	29b –29⅛a	29b –29⅛a
Nov.	28⅞b–29a	28⅞b–29a
No. 1 RSS, Spot	29⅛n	29⅛n
No. 3 amber blanket crepe, Oct.	26⅛n	26⅛n

FUTURES—REX CONTRACT

	Sept. 25	Prev. Close
Nov. ..	29.30b–29.60a	29.35b–29.50a
Jan. ..	28.95b–29.13a	28.90b–29.10a
March ..	28.80b–29.00a	28.80b–28.90a
May ..	28.75b–28.90a	28.70b–28.85a
July ..	28.75b–28.90a	28.70b–28.85a
Sept. ..	28.75b–28.90a	28.70b–28.85a

Sales: Nil. Tendency: Quiet.

Rubber futures were quiet and steady on September 25. Interest was light. Traders said physical rubber was quiet. Factories were showing little interest in buying. Some sources said the unsettled labour situation in the motor car industry and apparent adequate nearby stocks of rubber manufacturers offered little incentive for buying.

SINGAPORE

After a slightly higher opening, the market eased somewhat on September 25, as buyers tended to back away. Later in the day, on improved buying interest and reserve of sellers, prices steadied although quiet conditions continued. The market was slow to open in the afternoon. Prices held steady in quiet conditions. Lower sheet interest continued. Sellers were generally reluctant.

	Malayan cents per lb., fob Malayan ports to open ports Sept. 25	Prev. Close
No. 1 RSS, Oct. ..	85 –85⅛	84⅛–84⅜
Nov. ..	85⅛–85⅜	85 –85⅛
No. 2 RSS, Oct. ..	84⅜–84⅝	83⅞–84⅛
No. 3 RSS, Oct. ..	82½-83	82 -82½
No. 4 RSS, Oct. ..	80⅜–81⅜	80⅜–81⅜
No. 5 RSS, Oct. ..	77 –78	77 –77⅜
No 1 RSS, Spot ..	84⅛–84⅝	84 –84⅛
No. 3 blanket thick remilled crepe, Oct.	75⅛–76⅛	75 –76
No. 1 fine pale crepe, Oct.	93 –94	92⅛–93⅛
2X thin brown crepe, Oct.	72⅜–73⅜	72⅛–73⅛

Tendency: Quiet.

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob, at 168.00d. per gallon.

AMSTERDAM

The Amsterdam rubber market ruled as under on September 25:

No. 1 RMA	Guilders per kilo Sept. 25	Previous
September	2.37	2.36
October	2.37	2.36
November	2.37	2.36
December	2.37	2.36
October December ..	2.37	2.36
January	2.37	2.36

Sales: ½ Nil. ½ Tendency: Steady.

DJAKARTA

	Rupiahs per kilo Sept. 25	Previous
Spot No. 1 Priok ..	36.50b	36.50b
Spot No. 2 Priok ..	35.50b	35.50b
Spot No. 3 Priok ..	34.50b	34.50b
No. 1 fine pale crepe, spot	34.50b	34.00b

Tendency: Steady.

CEYLON

The price of No. 1 RSS at Colombo on September 25 was 103 (102¼) Ceylon cents per lb.

BANGKOK

The price of No. 1 RSS at Bangkok on September 25 was 27.75 (27.75) US cents per lb.

CROP RETURNS

Unless otherwise indicated, the figures quoted, to the nearest thousand lb., represent crop returns for the month stated and for the number of months of the planting company's financial year to date. Corresponding figures are given in parentheses.

RUBBER ESTATE AGENCY

June

Malayan Crop—3,040 (3,080). 9 mths—26,244 (26,184).
East Sumatra Crop—284 (273). 9 mths—2,709 (2,827).
Bandar Sumatra—74 (72). 11 mths—925 (942).
Batu Kawan—60 (56). 10 mths—588 (601).
Kepitigalla—89 (66). 3 mths—192 (154).
Langkat Sumatra—67 (79). 6 mths—436 (452).
Tambira—115 (85). 12 mths—1,281 (1,292).
Amalgamated Rubber—50 (43). 6 mths—286 (250).
Java Rubber—88 (90). 6 mths—517 (556).
Soember Ajoe—24 (21). 9 mths—189 (156).

July

Malayan Crop—3,279 (3,163). 10 mths—29,520 (29,347).
East Sumatra Crop—278 (305). 10 mths—2,987 (3,132).
Bandar Sumatra—79 (89). 12 mths—1,004 (1,031).
Batu Kawan—62 (67). 11 mths—650 (668).
Kepitigalla—74 (68). 4 mths—265 (222).
Langkat Sumatra—66 (84). 7 mths—502 (536).
Tambira—124 (109). 1 mth—124 (109).
Amalgamated Rubber—36 (45). 7 mths—322 (295).
Java Rubber—68 (69). 7 mths—585 (624).
Soember Rubber—17 (24). 10 mths—206 (179).
Sennah—141 (138). 7 mths—993 (941).

HARRISONS AND CROSFIELD LTD.

July

Malayalam—614 (605). 4 mths—2,964 (2,723).
Lunuva—107 (105). 7 mths—572 (675).
London Sumatra Group—2,769 (2,663). 4 mths—9,559 (8,979).
Bah Lias—179 (154). 9 mths—1,634 (1,345).
Central Sumatra—73 (72). 1 mth—73 (72).
Namoe Tongan—295 (245). 11 mths—3,061 (2,563).
Sialang—251 (241). 6 mths—1,182 (1,185).
Tanan Datar—86 (86). 7 mths—484 (454).

STOCK MARKET

Continued from page 520

of 10% from TOOTALS, the textile firm, which has diversified into the plastics field. After paying over more in tax this time the net profit of the group showed a good increase at £340,475. The whole of the issued capital of YATES DUXBURY AND SONS was purchased during the middle of September a year ago and the profits of this concern were included in the above figures.

At the halfway mark of the year profits of the ASSOCIATED ELECTRICAL INDUSTRIES giant showed an increase at £9.11m. An interim dividend of 1s. per £1 ordinary was declared which equals the two quarterly dividends paid for 1960. But then came the sting in the tail. For the board warned that it should not be assumed that the rate of dividend for the whole of the year will necessarily be maintained.

Industry INTELLIGENCE

Machines, Materials and Equipment

Ball Valves

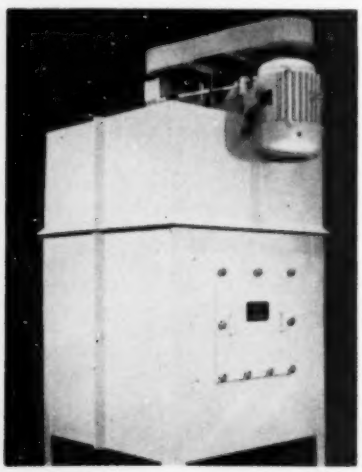
Serck Ltd., the Birmingham engineering group and the Jamesbury Corp. of Worcester, Massachusetts, have formed a new company, Jamesbury-Serck Ltd., Eastern Avenue, Gloucester, to manufacture and market the Jamesbury Double Seal ball valve.

In the JSL Double Seal design the rotating member is a sphere located beween two, patented, non metallic seats of carefully engineered section. These seats are made in a wide variety of materials, such as ptfe, buna-N, neoprene, nylon, etc., to suit particular service conditions. The basic conception is the employment of a seal with a flexible lip which is deflected on assembly to create an initial sealing force independent of line pressure.

The design of the ball valve caters for automatic take-up of wear and relaxation, requiring no maintenance; choice of seat materials to handle general, chemical and petroleum services; identical upstream and downstream seats which enable the valve to be installed irrespective of direction of flow; upstream and downstream sealing, which provides the Double Seal safety feature.

Batch Mixer

The fundamental principles of dry material batch mixing are employed in the Turner-Heeson ultra-rapid square



mixer, which is now in production at the Foxhall Works, Ipswich, of E. R. and F. Turner Ltd.

The material being mixed is discharged from a worm along its entire length of vertical travel and is thrown against an angular shaped housing. The effect of this action is to create a turbulating movement, with the result that the whole of the machine's capacity is used as a mixing area.

It is claimed that tests on materials such as antibiotics, powdered milk and foods and plastics, have shown that the machine produces a homogeneous mix in approximately quarter the time needed in standard mixers.

When traditional methods of mixing are employed, the material is conveyed up the worm and distributed at the top around the perimeter of the circular container. In the Turner-Heesen mixer the patented tapered worm causes material to fall away along its entire length, with the collapse increasing towards the centre.

The mixers are available in ¼ ton to 5 ton capacities. Because of their square design they occupy less space than traditional mixers. For example, the 1 ton machine measures only 8ft. 4in. x 4ft. 4¾in.

Technical Data

Diene Rubber

The International Synthetic Rubber Co. has recently been appointed sole UK agents for Diene rubber (*RPW* August 19, 278).

Diene is Firestone's stereospecific polybutadiene rubber and has some superior properties to both NR and SBR types. In general the advantageous properties are purity, abrasion resistance, resilience, hysteresis, uncured shrinkage and low temperature. Properties which may prove deficient are those of tensile, lack of tack and in general poorer processing if not used as a blend with other polymers.

A booklet on Diene rubbers is available from ISR, Hythe, Southampton, which contains several papers delivered by Firestone personnel at rubber conferences during the last year.

Ballotini Booklet

A leaflet has been issued by the English Glass Co. Ltd., Scudamore Road, N.P.E., Leicester, on Ballotini, a material which possesses a combination of valuable characteristics and is practically inert to all forms of chemical attack.

It is amorphous, being made of pure glass, and is obtainable, accurately graded, to the sizes given in the leaflet and nearly spherical. Ballotini is already being used to produce light reflecting surfaces, as a grinding medium for very fine pigments, to shot-blast fine finishes on moulds, and as a resin filler for mouldings and for electrical encapsulation. Another recent application for Ballotini is as the heat transfer medium in fluidized-bed vulcanization plant.

Vybak Extrusion Compounds

Bakelite Ltd., 12-18 Grosvenor Gardens, London, S.W.1, has issued a new folder dealing with Vybak pvc extrusion compounds.

The folder describes the properties and uses of the dielectric and sheathing compounds and general purpose compounds which are available in flexible opaque grades, flexible clear and rigid. Properties claimed to be common to the whole range of compounds include good flex life, electrical resistance, good resistance to water, chemicals, oils and grease, resistance to oxygen and ozone, abrasion resistance and self - extinguishing. Further copies of the folder and additional information are freely available from the company.

Publications

Common Chemical Market

Foster D. Snell Inc.'s Common Chemical Market directory of the chemical companies of the European Common Market and European Free Trade Association goes on general sale October 1 (*RPW* June 10, 889). This list of 6,000 European chemical companies has hitherto been available only to subscribers to the Snell marketing service, Chemical Market Abstracts.

The Common Chemical Market consists of 243 pages containing an alphabetical country-by-country listing of Europe's 6,000 chemical companies. Standard Industrial Classification numbers are given for each company. Each nation is introduced with a review of its chemical industry compiled by the editors of Chemical Market Abstracts.

The directory will be sold outright at $18 per copy, or in combination with a three-month trial subscription to Chemical Market Abstracts for $60.

Plasmarc Price List

Plastics Marketing Co. Ltd. of Sevenoaks, distributors of a wide range of plastics products including phenolic and melamine decorative laminates, pvc and polythene products, GRP sheets, expanded polystyrene and adhesives, is now concentrating its effort throughout London and the home counties to ensure a reliable sales and consultancy service. The company has now issued a new price list. The booklet, called 'Plasmarc Serves the Building Industry, includes notes for guidance of customers, times of Plasmarc delivery service, and the price list which is divided into sections, covering similar types of materials.

Copies of this price list can be obtained from the head office and sales department of the company at Buckhurst Avenue, Sevenoaks, Kent.

British Standards Institution

CODE OF PRACTICE FOR THE MAINTENANCE OF ELECTRIC MOTOR CONTROL GEAR

A new Code of Practice on the maintenance of electric motor control gear has been published by the British Standards Institution under the authority of the Council for Codes of Practice, and should prove of value to all concerned with the maintenance and management of electrically powered industrial plants. The code (CP 1011) provides guidance on those matters which experience has shown to be of major importance in keeping electric motor control gear in efficient working condition. The various statutory regulations with which electrical installations may have to comply are indicated, together with such important general matters as inspection, observance of manufacturers' instructions, and the analysis of faults.

An important section deals with the safety of personnel operating the installation, and emphasizes such important precautions as: isolation before maintenance work is carried out; the use of voltage indicators; special precautions in dealing with oil-immersed equipment; and the maintenance of earthing connexions. Notes are included on first-aid and fire extinguishing equipment.

The main section of the code sets out general principles of maintenance which are applicable to most types of equipment, followed by detailed recommendations for various types of control gear such as contactors, drum controllers, overload and time-delay devices, liquid starters and controllers, push button and similar auxiliary devices, isolators and composite units of switches and fuses.

This code may be obtained from the British Standards Institution, British Standards House, 2 Park Street, London, W.1, price 6s.

Export Opportunities

Laminating Machine

Thoresen and Co. (East Africa) Ltd., P.O. Box 6777, Nairobi, wants to contact a UK supplier of an inexpensive machine suitable to laminate playing cards. The laminating matter could be polythene, cellulose or any other suitable material.

UK firms should write direct to the East African firm, at the same time notifying the UK Trade Commissioner, P.O. Box 30133, First Floor, Cotts House, Elliott Street, Nairobi, Kenya Colony, that they have done so.

Rubber Growers

As from October 2 the address of the following organizations will be at Plantation House, 10-15 Mincing Lane, London, E.C.3; the Rubber Growers' Association, Malgro House, the Indonesia Association, Crepe Sole Rubber Association of London, and Crepe Sole Publicity Committee.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationary Office.

Crilat

(819,602). Synthetic resins for use in manufacture. Montecatini Società Generale per l'Industria Mineraria e Chimica, 1-2 Largo Guido Donegani, Milan, Italy. Address for service is c/o Eric Potter and Clarkson, 317 High Holborn, London, W.C.1. (Class 1; August 9 1961.)

ARBURG allrounder

(815,622). Machines for processing thermo-plastics, and parts included in Class 7 of such machines. Arthur Hehl, Karl Hehl and Eugen Hehl, trading as Arburg Feingeraetefabrik O.H.G. Hehl and Soehne, Lossburg, Wuerttemberg, Germany. Address for service is c/o Potts and Co., 15 Hamilton Square, Birkenhead. (Class 7; August 9 1961.)

DAVIES DEFIANT

(817,572). Tyres for vehicles. Davies Tyre Co. Ltd., Gemini House, High Street, Edgware, Middlesex. To be associated with No. 450,313 (2,423, 1,981). (Class 12; August 9 1961.)

Miniwrap (B809,237). Wrapping and packaging materials made of paper, cardboard, laminations of polythene film or of regenerated cellulose film. Hamac A.G., Bahnhofstrasse 5, Zug, Switzerland. Address for service is c/o A. A. Thornton and Co., Northumberland House, 303-306 High Holborn, London, W.C.1. (Class 15; August 9 1961.)

Polisax (815,542). Wrapping and packing materials in the nature of sacks made of flexible plastics. British Visqueen Ltd., Imperial Chemical House, Millbank, London, S.W.1. To be associated with No. 804,553 (4,304, 261) and others. (Class 16; August 9 1961).

Veral (813,342). All goods included in Class 17, none being of synthetic rubber or plastics, but not including tapes or wrappings for insulating and sealing, or any goods of the same description as any of these excluded goods. Société Nouvelle Siplast, 99 Rue de Flandre, Paris 19ème, France. Address for service is c/o R. G. C. Jenkins and Co., Chancery House, 53-64 Chancery Lane, London, W.C.2. (Class 17; August 9 1961.)

Thermocap (B814,166). Cap-shaped articles made wholly or principally of plastics for use in the insulation of electrical apparatus. Raychem UK Ltd., Highams Park, London, E.4. (Class 17; August 9 1961.)

Thermofit (B814,167). Articles made wholly or principally of plastics for use in the insulation of electrical apparatus. Raychem UK Ltd., Highams Park, London, E.4. (Class 17; August 9 1961.)

Burlite (816,030). Thermal insulation materials. J. Burns Ltd., Wangye Works, High Road, Chadwell Heath, Essex. (Class 17; August 9 1961.)

Crilat (819,081). Gutta-percha, india rubber, balata, imitation gutta-percha, imitation india rubber and imitation balata; and articles included in Class 17 made from all these goods; plastics included in Class 17 in the form of sheets, blocks, rods and tubes; caulking materials and insulating materials. Montecatini Società Generale per l'Industria Mineraria e Chimica, 1-2 Largo Guido Donegani, Milan, Italy. (Class 17; August 9 1961.)

Polisax (815,543). Sacks made of flexible plastics. British Visqueen Ltd., Imperial Chemical House, Millbank, London, S.W.1. To be associated with No. 804,554 (4,305, 302) and others. (Class 22; August 9 1961.)

Hyvin (814,707). Compounds of polyvinyl chloride included in Class 1. Vinatex Ltd., Devonshire Road, Carshalton, Surrey. (Class 1; August 16 1961.)

Norplas (821,067). Chemical substances for use in the manufacture and reclamation of plastics. Edward Baguley Muff, 14 Mauldeth Road, Heaton Mersey, Stockport, Cheshire. To be associated with No. 821,071 (4,329, 1,113). (Class 1; August 16 1961.)

Udex (821,288). Chemical products used in industry; alkylene glycols and polyalkylene glycols. The Dow Chemical Co., City of Midland, State of Michigan, USA. Address for service is c/o W. P. Thompson and Co., 12 Church Street, Liverpool, 1. (Class 1; August 16 1961.)

Bondene (812,678). Non-ferrous metal sheeting, having a surface laminate of plastics. The Central Manufacturing and Trading Co. (Dudley) Ltd., 24 Halesowen Road, Old Hill, Staffordshire. (Class 6; August 16 1961.)

Volpak (798,687). Materials included in Class 17 in the form of sheets, tubes and rods, all being goods made of laminations of synthetic plastics and regenerated cellulose. Hamac A.G., Bahnhofstrasse 5, Zug, Switzerland. Address for service is c/o A. A. Thornton and Co., Northumberland House, 303-306 High Holborn, London, W.C.1. (Class 17; August 16 1961.)

Kordite (798,788). Foils, films and sheets, all of plastics and included in Class 17; and protective covers included in Class 17, made therefrom. Kordite Corporation, Macedon, State of New York, USA. Address for service is c/o Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. (Class 17; August 16 1961.)

Sheerline (815,470). All goods included in Class 17 made of plastics or of foamed rubber or of a combination of these materials. B T R Industries Ltd., Herga House, Vincent Square, London, S.W.1. (Class 17; August 16 1961.)

These modern double shell moulded chairs are constructed from Scott Bader Crystic 404 polyester resin reinforced with chopped strand mat and woven rovings. The legs screw into metal inserts moulded in the lower shells and have pvc ball feet

NEW COMPANIES

Roxborough Glass Fibre Ltd. (701,139). August 18. Capital: £2,000 in £1 shares. The directors are: Alfred Clark and Mrs Martha L. Clark, both of Flat 30, 16 Roxborough Avenue, Harrow, Middx. Regd. office: 311b Rayners Lane, Pinner, Middx.

Hispeed (Moulding) Ltd. (701,081). August 17. Capital: £1,000 in £1 shares. To carry on the business of manufacturers, moulders and fabricators of and dealers in plastic substances, etc. The directors are: Samuel Swimmer, 243 Baker Street, N.W.1; Jack Kagan, 17 Heathfield Gardens, N.W.11; Harold Macasky, 4 Chedworth House, Geldeston Road, E.5. Regd. office: 22-23 Gloucester Mansions, Cambridge Circus, W.C.2.

Plastic Distributors (Southern) Ltd. (700,945). August 16. Capital: £100 in 6s. 8d. shares. The directors are to be appointed by the subscribers.

Plastic Handrail Co. Ltd. (700,946). August 16. Capital: £100 in £1 shares. The directors are: Ronald G. Savage, 14 Highbury Terrace, N.5; A. J. C. Hugh, 19 Grosvenor Crescent Mews, S.W.1. Regd. office: 14 Highbury Terrace, N.5.

Elevated Storage & Engineering Ltd. (700,999). August 16. Capital: £1,000 in £1 shares. To carry on the business of manufacturers of, and dealers in, plastics, rubber and micanate substances, insulating materials and all other allied products, etc. The directors are: Peter L. Cook and Mrs Patricia M. Cook, both of White House, Broomwater, Teddington, Middx. Regd. office: Laurence Estate, Green Lane, Hounslow, Middx.

L. and C. Weatherwear Ltd. (700,805). August 14. Capital: £100 in £1 shares. To carry on the business of manufacturers of, and dealers in, rubber, waterproof, showerproof, sports and casual clothing, etc. The directors are: Gertrude A. Tarbuck, 18 Shore Road, Ainsdale, Southport; Nancy M. Wilkinson, 1 Church Road, Hale, Liverpool; Stephen Minion, O.B.E., J.P., 223 Booker Avenue, Allerton, Liverpool 18. Regd. office: 39/43 Berry Street, Liverpool 1.

Thomas E. Rowe and Co. Ltd. (700,704). August 11. Capital: £100 in £1 shares. To carry on the business of dealers in, and manufacturers of, travel and other goods, particularly in leather and plastics, etc. The first directors are to be appointed by the subscribers.

Springwell (Mouldings) Ltd. (700,774). August 14. Capital: £20,000 in £1 shares. To carry on the business of manufacturers and moulders of plastics, etc. The directors are: Henry T. Hupfield and Josephine S. Hupfield, both of 10 West Park Avenue, Southborough, Tunbridge Wells, Kent. Regd. office: 10 West Park Avenue, Southborough, Tunbridge Wells, Kent.

Carstafame Ltd. (700,713). August 14. Capital: £100 in £1 shares. To carry on the business of manufacturers of, and dealers in, tyres, etc. The first directors are to be appointed by the subscribers.

Bransom Kent Ltd. (700,924). August 15. Capital: £100 in £1 shares. To carry on the business of manufacturers of, and dealers in, pneumatic and other tyres and wheels, cycles, bicycles, motor cycles, motor cars, etc. The first directors are to be appointed by the subscribers. Regd. office: 18 Harcourt House, 19 Cavendish Square, W.1.

Increases of Capital

Bristol Aeroplane Plastics Ltd. (652,821), Stonebridge House, Colston Avenue, Bristol, 1. Increased on December 22 1960, by £49,900 in £1 ordinary shares, beyond the registered capital of £100.

Ketch Plastics Ltd. (353,478), Trent Valley Works, Lichfield. Increased on December 8 1960, by £25,000 in £1 ordinary shares, beyond the registered capital of £5,000.

F. Bateman (Plastics) Ltd. (613,369), Maybank Works, Maybank Avenue, Sudbury, Wembley, Middlesex. Increased on December 23 1960, by £900 in £1 ordinary shares, beyond the registered capital of £100.

Harold Franks and Co. Ltd. (408,486), plastics etc., Fablon House, Church Street, Pendleton, Salford, 6. Increased on January 10 1961, by £100 in £1 ordinary shares, beyond the registered capital of £10,000.

Wola Products Ltd. (610,472), designers, manufacturers of, and dealers in, plastics articles, etc., 4 Broad Street Place, E.C.2. Increased on December 14 1960, by £40,000 in £1 shares, beyond the registered capital of £60,000.

CLASSIFIED ADVERTISEMENTS

RUBBER AND PLASTICS WEEKLY

Owing to ever increasing production costs, the publishers of RUBBER & PLASTICS WEEKLY regret that they are compelled to make a slight increase in their charges for Classified Advertisements.

As from October 1 1961, all headings other than Auctions and Tenders will be 8d. per word. Minimum 12s. Box No. 2s. extra.

The charge for Auctions and Tenders will be 5s. 6d. per line. Minimum 38s. 6d.

APPOINTMENTS VACANT

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INDEX to ADVERTISERS

	Page
Abrasive Developments Ltd.	—
A.E.W. Ltd.	—
Allcock, J., & Sons Ltd.	—
Amalgamated Oxides (1939) Ltd.	—
Anchor Chemical Co. Ltd.	viii
Anderson, Joseph, & Sons Ltd.	—
Armour Hess Chemicals Ltd.	—
Associated-Rediffusion Ltd.	—
Astor Boisselier & Lawrence Ltd.	—
Baker Perkins Ltd.	511
Barwell Engineering Ltd.	—
Belgrave Industries (Exports) Ltd.	—
Berk, F. W., & Co. Ltd.	—
Berstorff, Hermann	—
B.I.P. Chemicals Ltd.	—
Birch, Singleton, W., & Sons Ltd.	—
Bone Bros.	—
Boston Marine & General Eng. Co. Ltd.	—
Bridge, David, & Co. Ltd.	494
Bright, John, & Bros. Ltd.	—
British Electrical Development Association	—
British Geon Ltd.	—
British Nylon Spinners Ltd.	—
British Recovered Rubber Co. Ltd.	iii
British Resin Products Ltd.	—
British Titan Products Co. Ltd.	—
British Transport Commission	—
Bush Beach & Segner Bayley Ltd.	—
Cabot Carbon Ltd.	503
Carter Bros. (Rochdale) Ltd.	—
Carlton Press Knives Ltd.	—
Chance & Hunt	—
C.I.C. Engineering Ltd.	—
Cleggswood Oil Distillery Ltd.	—
Cohen, George, Sons & Co. Ltd.	—
Columbian International (Gt. Britain) Ltd.	vii
Consolidated Zinc Corporation (Sales) Ltd.	vi
Courtaulds Ltd.	—
Crosfield, Joseph, & Sons Ltd.	—
Croxton & Garry Ltd.	528
Derrick Davis Plastics Ltd.	—
Dietzel, Hugo	—
Distillers Co. Ltd., The	—
Dixon, T. H., & Co. Ltd.	—
Docker, John, & Co. (Engs.) Ltd.	493
Dunlop Rubber Co. Ltd.	—
Du Pont Co. (United Kingdom) Ltd.	—
Durham Raw Materials Ltd.	—
Economist Intelligence Unit Ltd., The	—
Ellison, George, Ltd.	—
English Clays Lovering Pochin & Co. Ltd.	—
English Electric Co. Ltd., The	iv
Esso	—
eur-O-matic	—
Fawcett Preston & Co. Ltd.	i
Ferguson, A. O., & Co. Ltd.	—
Ferguson, James, & Sons Ltd.	—

	Page
Ferguson Shiers Ltd.	—
Firestone Tyre & Rubber Co. Ltd.	—
Foamair Ltd.	—
Geigy Co. Ltd., The	—
Goodyear Tyre & Rubber Co. Ltd.	—
Greeff, R. W., & Co. Ltd.	—
Gresham & Craven Ltd.	—
Gummi und Asbest	526
H.F. Industrial Services Ltd.	—
H.K. Import & Export Ltd.	—
Halsteads Engineers (Leyland) Ltd.	—
Hankin, Geo., & Co. Ltd.	—
Hardman & Holden Ltd.	—
Harrison Jones	—
Hatcham Rubber Co. Ltd.	527
Hay & Robertson Ltd.	—
Hilton, Wallace, & Co. Ltd.	527
Hubron Rubber Chemicals Ltd.	Cover iv
Hughes & Hughes Ltd.	—
Hunt Heat Exchangers Ltd.	—
Iddon Bros. Ltd.	—
Iliffe Industrial Publications Ltd.	—
Imperial Chemical Industries Ltd. (Billingham)	—
Imperial Chemical Industries Ltd. (Dyestuffs)	Cover i
Imperial Chemical Industries Ltd. (Plastics—Alkathene)	—
Imperial Chemical Industries Ltd. (Terylene)	—
Institution of the Rubber Industry	—
International Corporation Ltd.	—
International Synthetic Rubber Co. Ltd.	499
Ioco Ltd.	—
K.W. Chemicals	—
Kautschuk und Gummi	—
Kendell, T., & Sons Ltd.	—
Ketjen Carbon	—
Kuala Lumpur-Kepong Amalgamated Ltd.	—
Lankro Chemicals Ltd.	—
Laporte Titanium Ltd.	507
Latex Engineering Co.	514
Lavino (London) Ltd.	—
Leaver, Donald, Ltd.	—
Leeds & Bradford Boiler Co. Ltd., The	—
Lindsay & Williams Ltd.	—
Lonabarc Ltd.	—
Londex Ltd.	—
London & Scandinavian	—
Lord, R., & Sons Ltd.	—
McKechnie Bros. Ltd.	—
Maclaine, Watson & Co. Ltd.	—
Mersey White Lead Co. Ltd., The	—
Metal Box Co.	—
Micafine Ltd.	—
Monsanto Chemicals Ltd.	—
Morton Machine Co. Ltd.	—
Muehlstein, H., & Co. (London) Ltd.	—
Muller, Max	—
Natural Rubber Bureau	—
New Conveyor Co. Ltd.	—

	Page
Nederlandsch Verkoopkantoor Voor Chemische Producten N.V.	—
Noble Lowndes Pension Service, The	—
Northwestern Rubber Co. Ltd.	—
Novadel Ltd.	—
Oswald & Duncan Ltd.	—
Philblack Ltd.	—
Phoenix Rubber Co. Ltd.	—
Planters Engineering Co. Ltd.	527
Polymer (United Kingdom) Ltd.	—
Preston Tyre Fabric Manufacturing Co. Ltd.	—
Price's (Bromborough) Ltd.	—
Pullen, James H., (1942) Ltd.	vi
Quick-Wrap Tubing Co. Ltd.	—
Reed Bros. (Eng.) Ltd.	—
Revue Generale du Caoutchouc	—
Rhein-Chemie GmbH.	—
Robinson Bros. Ltd.	—
Ro-Search Inc.	—
Robinson, Joseph, & Co. Ltd.	516
Rotunda Ltd.	—
Rubber Age (New York) Ltd.	—
Rubber Estate Agency Ltd.	—
Rubber Latex Ltd.	516
Rubber Regenerating Co. Ltd.,	Cover ii
Scott Bader & Co. Ltd.	—
Sealants Ltd.	—
Shaw, Francis, & Co. Ltd.	—
Shell Mex & B.P. Ltd.	513
Shell International Chemical Co. Ltd.	501
Smith, Alfred, Ltd.	v
Smith, Wilfrid, Ltd.	—
Squire, Frederick, Ltd.	—
Stechler, L., & Co. Ltd.	—
Steel, J. M., & Co. Ltd.	—
Steele & Cowlishaw Ltd.	—
Stocker, W. B., & Co. Ltd.	—
Storeys of Lancaster	—
Stott, James, Ltd.	ii
Sturge, John & E., Ltd.	—
Sussex Rubber Co. Ltd.	—
Sutcliffe Engineering Components Ltd.	—
Sutcliffe Speakman & Co. Ltd.	—
Tanner Bros. (Greenfield) Ltd.	—
Tilghman's Ltd.	—
Union Carbide Ltd.	—
United Norit Sales Corporation Ltd.	—
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Verson Engineering Co. Ltd.	—
Wallace, H. W., & Co. Ltd.	—
Wallis Engineering Co.	—
Washington Chemicals	—
Webb, W. F. (Engineers) Ltd.	527
Welwyn Tool Co. Ltd.	—
Whiffen & Sons Ltd.	—
Witco Chemical Co. Ltd.	514
Zama Ltd.	—

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